Autopilot

AUTOMATED STEERING SYSTEM

INSTALLATION INSTRUCTIONS

Case IH tractors	▶ Luxxum 100 ▶ Luxxum 110 ▶ Luxxum 120
Case IH Tractors: Tier 5 models	▶ Farmall 75C ▶ Farmall 95C ▶ Farmall 105C ▶ Farmall 115C
New Holland Tractors	▶ TD5.85 ▶ TD5.95 ▶ TD5.105 ▶ TD5.115
New Holland Tractors: T5 MY 2020 and newer / Dual command and Electro command	▶ T5.95 ▶ T5.105 ▶ T5.115

Version 8.00
Revision C
February 2023
P/N 54035-1154-E08-C

Trimble Agriculture

Legal Notices

Agriculture Business Area

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Release Notice

This is the February 2023 release (Revision C) of the *Autopilot Automated Steering System Installation Instructions*, part number 54035-1154-E08-C. It applies to version 8.00 of the Autopilot automated steering system.

Notice to Our European Union Customers

For product recycling instructions and more information, please go to:
trimble.com/en/our-commitment/responsible-business/corporate-compliance/environmental-compliance



Safety Information

Always follow the instructions that accompany a Warning or Caution. The information they provide is intended to minimize the risk of personal injury and/or damage to property. In particular, observe safety instructions that are presented in the following format:

⚠ **WARNING –** This alert warns of a potential hazard, which, if not avoided, can cause severe injury.

⚠ **CAUTION –** This alert warns of a hazard or unsafe practice which, if not avoided, can cause injury or damage.

NOTE – An absence of specific alerts does not mean that there are no safety risks involved.

Warnings

⚠ **WARNING –** When you are working on the vehicle's hydraulic systems, vehicle attachments that are suspended can drop. If you are working around the vehicle, you could suffer serious injury if an attachment dropped on you. To avoid this risk, lower all vehicle attachments to the ground before you begin work.

⚠ **WARNING –** If someone else attempts to drive the vehicle while you are working on or under it, you can suffer serious or fatal injuries. To avoid this possibility, install a lockout box on the battery terminal to prevent the battery from being reconnected, remove the key from the vehicle's ignition switch, and attach a "Do not operate" tag in the cab.

⚠ **WARNING –** Agricultural chemicals can pose serious health risks. If the vehicle has been used to apply agricultural chemicals, steam clean the vehicle to remove any chemical residue from the areas of the vehicle where you will be working.

⚠ **WARNING –** Vehicle cabs can be quite high in the air. To avoid potentially serious injury through falling from this height, always use the steps and handrails, and face the vehicle, when you enter or exit it.

Cautions

⚠ **CAUTION –** When the vehicle has been running, parts of the vehicle, including the engine and exhaust, can become extremely hot and can cause serious burns. To avoid burns, allow hot machine parts to cool before you begin working on them.

⚠ **CAUTION –** The system installation may bring you into contact with chemical substances, such as oil, which can cause poisoning. Wash your hands thoroughly after you finish working on the system.

⚠ **CAUTION –** Battery posts, terminals, and related accessories contain lead and lead compounds, which can cause serious illness. To avoid ingesting lead, wash your hands thoroughly after touching the battery.

⚠ **CAUTION –** Always wear protective equipment appropriate to the job conditions and the nature of the vehicle. This includes wearing protective glasses when you use pressurized air or water, and correct protective welder's clothing when welding. Avoid wearing loose clothing or jewelry that can catch on machine parts or tools.

⚠ **CAUTION –** Parts of the vehicle may be under pressure. To avoid injury from pressurized parts, relieve all pressure in oil, air, and water systems before you disconnect any lines, fittings, or related items. To avoid being sprayed by pressurized liquids, hold a rag over fill caps, breathers, or hose connections when you remove them. Do not use your bare hands to check for hydraulic leaks. Use a board or cardboard instead.

⚠ **CAUTION –** Do not direct pressurized water at:
- Electronic or electrical components or connectors
- Bearings
- Hydraulic seals
- Fuel injection pumps
- Any other sensitive parts or components

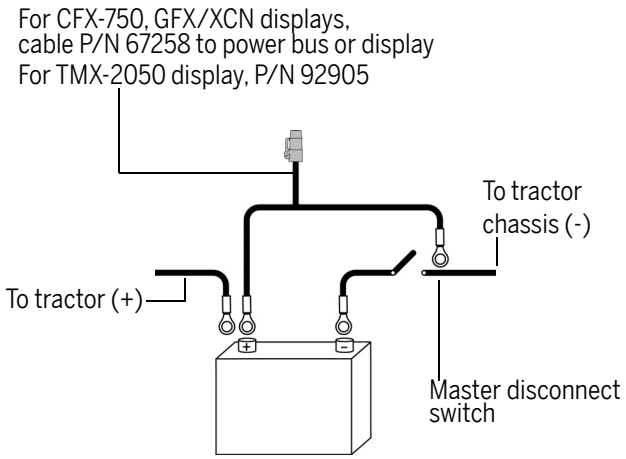


Set the hose pressure as low as practicable, and spray at a 45° to 90° angle. Keep the nozzle of the power washer away from the machine at the distance recommended by the manufacturer.

⚠ **CAUTION –** To prevent damage to the system, make sure that no wires or hoses interfere with or catch on any mechanical linkages, or contact any machine parts that get hot.

⚠ **CAUTION –** If the vehicle has a master electrical disconnect, make sure the basic power cable (P/N 67258 / 92905) is *not* directly attached to the battery terminal that is disconnected by the master switch—the negative pole in this example.

Attach this terminal side just past the main disconnect so that it is as close as possible to the battery but still gets disconnected when the master disconnect is turned off. Failure to do so can result in damaging the display.



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1

Introduction

- Technical assistance
- Manual system upgrade to Autopilot
- Required components
- Autopilot hardware organization: As shipped
- Preparing the vehicle for installation

This manual describes how to install the Trimble® Autopilot™ automated steering system.

Even if you have used other Global Navigation Satellite System (GNSS) such as the United States', Trimble recommends that you spend some time reading this manual to learn about the special features of this product. If you are not familiar with GNSS, visit the Trimble website (trimble.com) for an interactive look at Trimble and GNSS.

Technical assistance

If you have a problem and cannot find the information you need in the product documentation, contact Trimble technical support:

1. Log into agpartners.trimble.com.
2. Click the **Feedfieldback** link at the right of the screen. A form appears.
3. Complete the form and then click **Submit Feedback.**

Manual system upgrade to Autopilot

Trimble displays

Retain
CFX-750™/FM-750™ display: P/N 94110-xx
Power cable CFX-750 display: P/N 77282
Antenna for display: P/N 60600-02 (DGPS) or 77038-00 (OmniSTAR®/RTK)
Antenna to receiver cable: P/N 50449
Basic cable (CFX-750 display): P/N 67258
TMX-2050™/XCN-2050™ display: P/N 96700-00
TM-200 Module: P/N 95060-00
TM-200 Module to display cable: P/N 93843
TM-200 Module power I/O cable: P/N 92676
TM-200 Module battery cable: P/N 92905
GFX/XCN display: 13x000-01
Power cable GFX/XCN: P/N 110551
Base power cable: P/N 67258
NAV-900 guidance controller: P/N 108993-05
GFX/XCN display to NAV-900 Comms cable: P/N 110540

Required components

Kits required	Special tools
Platform kit: P/N 54035-1154	10.5 mm drill bit
Hydraulic hose kit: P/N 119134-2000 - Case Luxxum P/N 119164-2000 - NH TD 5.xxx P/N 119278-2000 - NH T5.xxx 2020+/Farmall C	Allen wrench set (metric and imperial)

Antenna mounting kits

Kits required
Ag15 antenna mounting plate: P/N 62034 Bracket, GPS - V base plate indexing: P/N 62388-02 Optional spar mounts (must measure application for proper part number): P/N 64898: Bracket, GPS Spar 16.5"– 28.5" P/N 55349: Bracket, GPS Spar 27.5"– 37.5" P/N 53676: Bracket, GPS Spar 36.5"– 46.5" P/N 55348: Bracket, GPS Spar 45"– 55" P/N 66774: Bracket, GPS Spar 54"– 64" **NOTE –** For quick release mounting of the NAV-900 to a Spar mount, use P/N 110308: Bracket, NAV-900, Spar Quick Release Adapter.

Accessory kits

Accessory options
Remote engage switch assembly – standard Euro: P/N 57227-10 Remote engage switch assembly – full Euro: P/N 57227-20 Remote engage foot pedal: P/N 57259 Remote engage push button: P/N 101250

Autopilot hardware organization: As shipped

Hardware	Component	See...
Platform kit: P/N 54035-1154	Hydraulic valve	Chapter 2
	Hydraulic manifold	
	Transducer flow switch	
	Manual override cable	
	Hydraulic brackets and bolt kits	
	Hydraulic valve cable	
	IMD-900 steering device and cabling	Chapter 3
	IMD-900 mounting bracket and hardware	
	Power switch	Chapter 6
	Bolt kit controller	Chapter 8
Common parts	Controller	Chapter 8
	Controller mounting bracket	
	Cable kit: • Main wiring harness • Power bus auxiliary wiring harness • Sonalert alarm	

Hardware	Component	See...
GNSS receiver	GNSS receiver	Chapter 4
	GNSS antenna	
	GNSS receiver power/data cable	
	RTK radio, cable, and radio antenna	
Display	CFX-750 display, GFX/XCN display	Chapter 5
	TMX-2050 display	
	Display cable	
	Mounting bracket	
Hydraulic hose kit for all machines: P/N 119134-2000 P/N 119164-2000 P/N 119278-2000	Hydraulic hoses	Chapter 2
	Hydraulic adapters	
Roof bracket kit: P/N 62388-02 Bracket, GPS spar 36.5" - 46.5": P/N 53676 Bracket, GPS spar 54" - 64: P/N 66774	Roof brackets	Chapter 4
	Bolt kit, roof bracket	

Preparing the vehicle for installation

1. Park the vehicle on a hard, level surface. Block the front and rear wheels.
2. Align the steering straight ahead. On an articulated vehicle, install the articulation locks.
3. Remove all dirt and debris from the areas of the vehicle where the Autopilot system will be installed.
4. Open all kit boxes and check the contents of the box against the packing list/s. Lay all of the parts out on a clean workbench.

NOTE – The left and right sides of the vehicle are referenced while standing behind the unit, facing the normal direction of travel.

2

Hydraulic Control Valve Installation

- Hydraulic control valve preparation—All platforms
- Hydraulic control valve installation—Case Luxxum models - 119134-2000 hose and fitting kit
- Hydraulic control valve installation— NH TD5 models - 119164-2000 hose and fitting kit
- Hydraulic control valve installation—NH T5 MY 2020+ and Farmall C Tier 5 models - 119278-2000 hose and fitting kit

Hydraulic control valve preparation—All platforms

Assembling the hydraulic control valve

⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

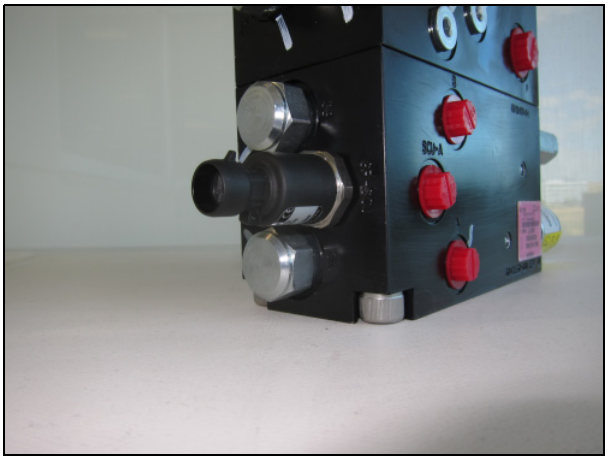
Gather the manifold, fittings and cartridges for preparing the manifold on a clean work surface.

Connecting the manual override pressure transducer to the H4 manifold

The GP-SCU port should be used for the manual override pressure transducer.



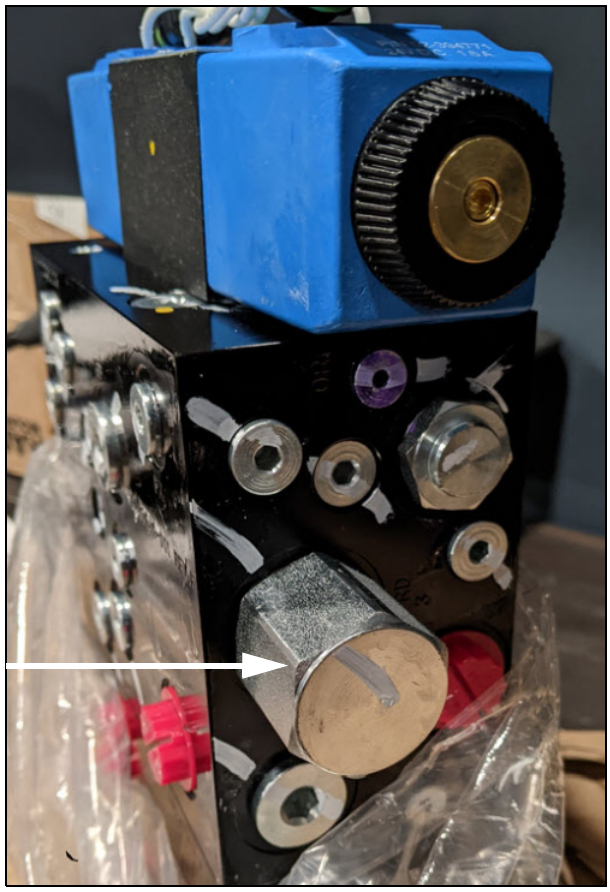
The manual override pressure transducer is installed into the GP-SCU port as shown.



Open center priority flow with PFRD cartridge—Pre-installed

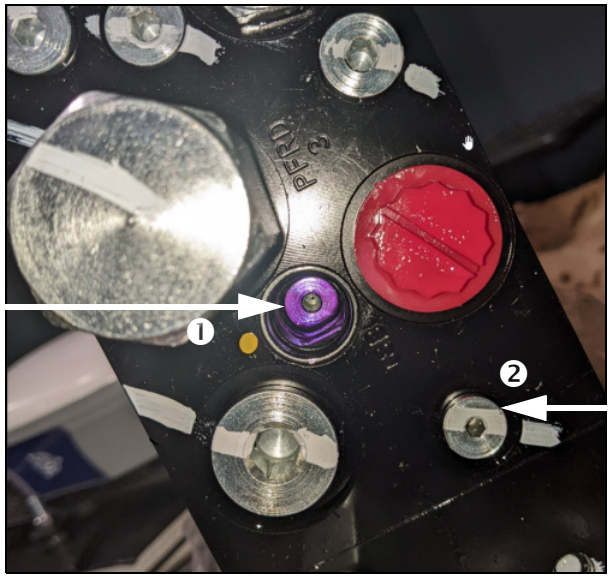
The platform kit P/N 54035-1154 Revision C and newer come with the PFRD pre-installed and the 18B orifice installed in the correct location for open center operation with the PFRD.

Verify if the PFRD is installed.



The orifice (1) is pre-installed behind the plug in the 18B location.

The plug will also be located in the orifice park location (2).



Open center priority flow with PFRD cartridge—Not pre-installed

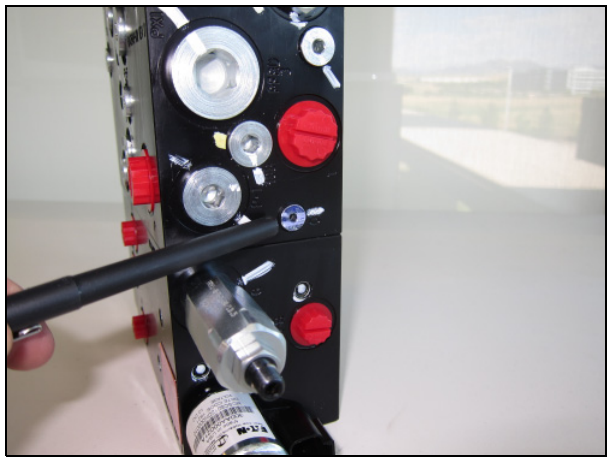
Use the following steps if the PFRD and orifice are not pre-installed.

Step 1

Configure the manifold for open center applications.

For open center the EF plug is removed and the EF hose is connected.

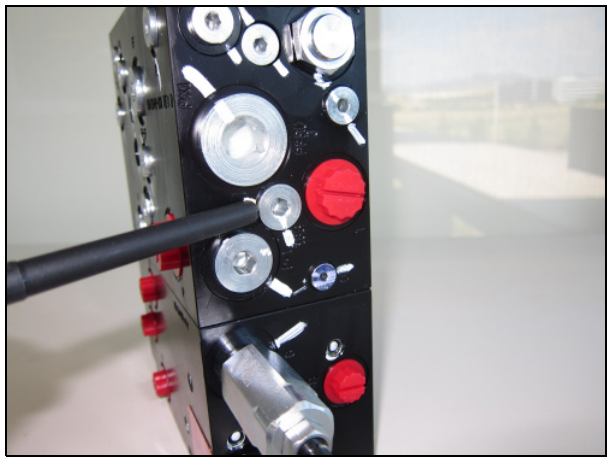
Locate and remove the orifice plug from its parking location shown here.

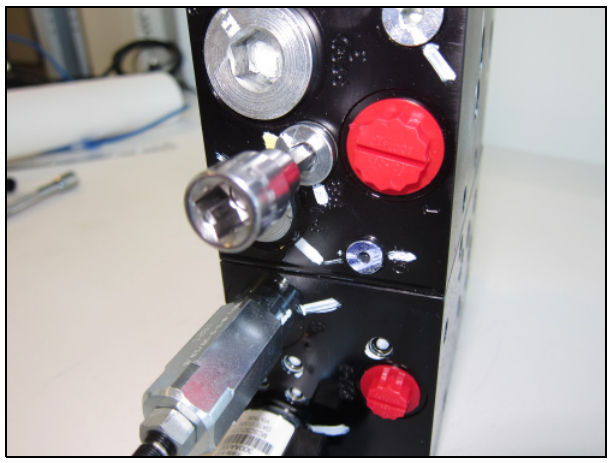


Step 2

Remove the plug from the 18B location (shown).

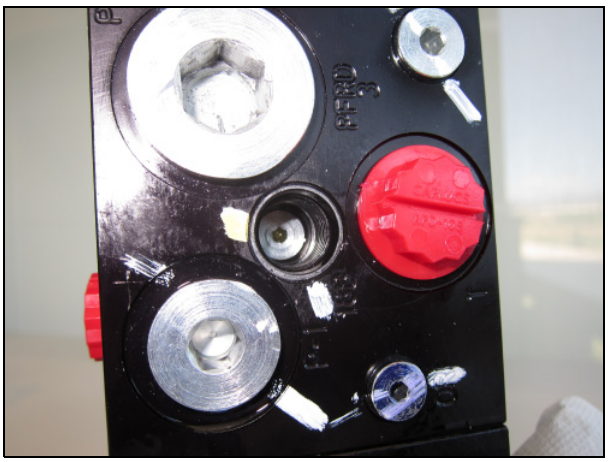
The orifice plug should be installed behind this plug.





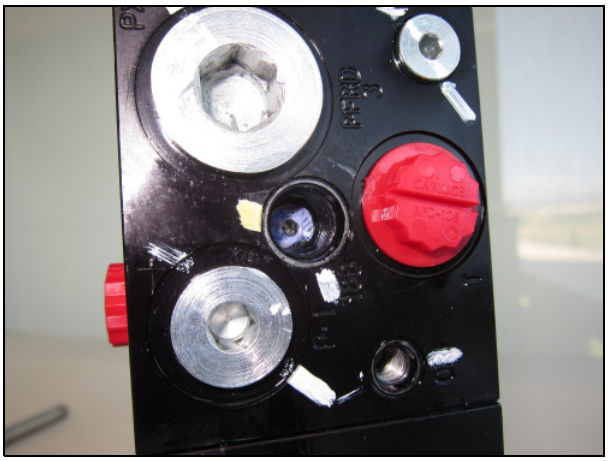
Step 3

Remove the solid plug located behind the 18B plug previously removed.



Step 4

Install the orifice plug in the location behind the 18B plug.



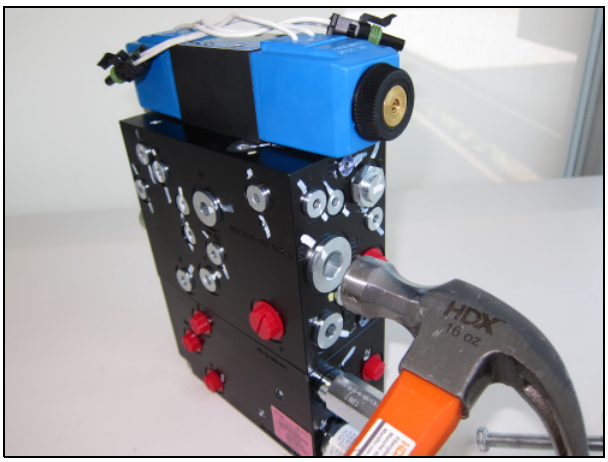
The solid plug may be stored in the parking location.



Step 5

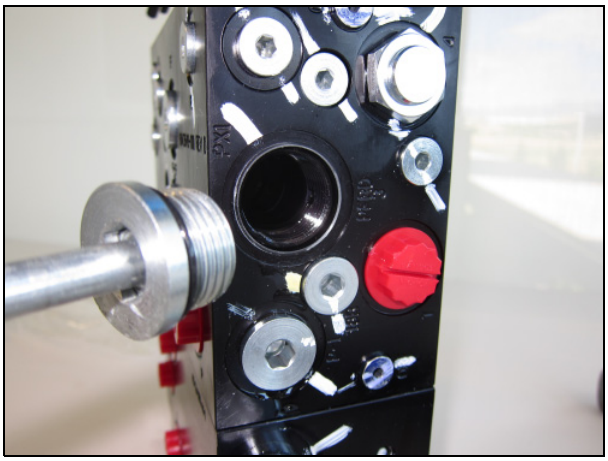
The PFRD cartridge is used as a priority flow cartridge with a EF hose connected to the manifold.

TIP – Tapping on the plug with a hammer can make the plug easier to loosen.



Step 6

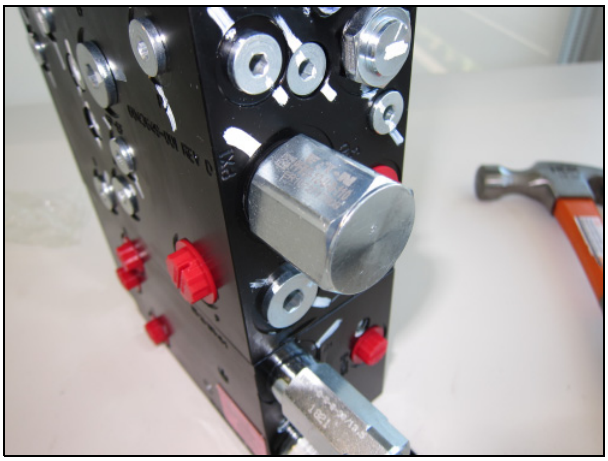
Remove the plug from the PFRD port.



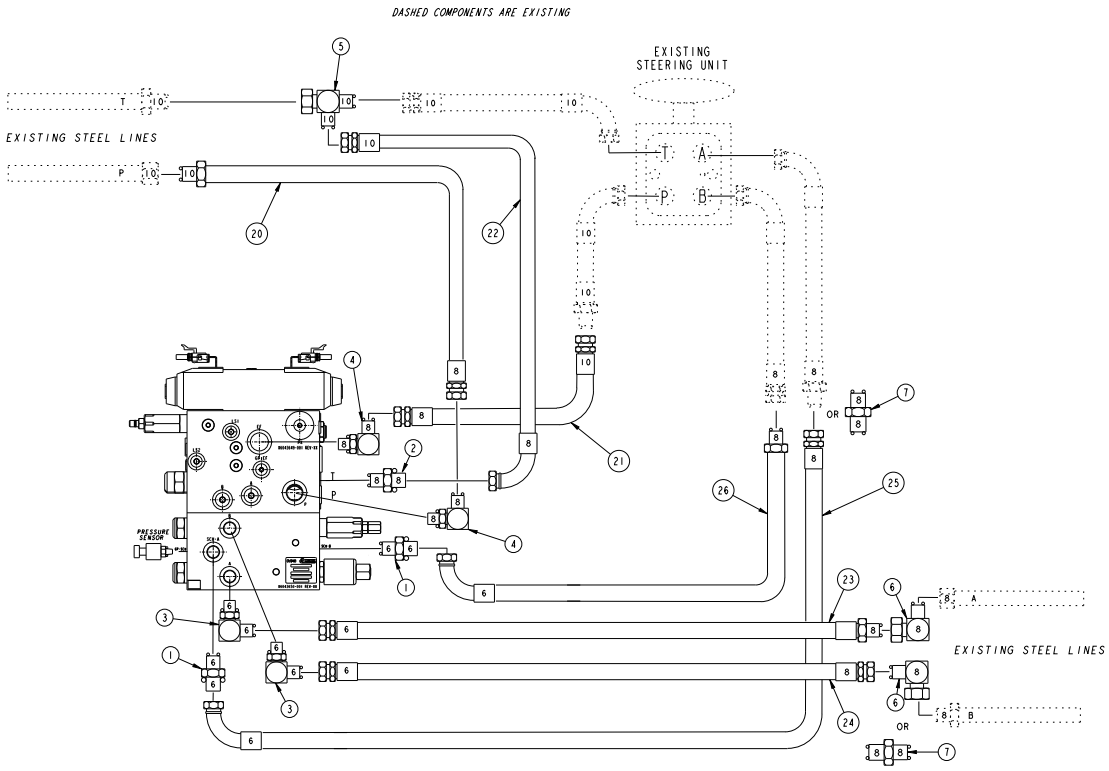
Step 7

Install the PFRD cartridge as shown here.

- 110 PSI PFRD, Trimble P/N 66113



Hydraulic control valve installation—Case Luxxum models - 119134-2000 hose and fitting kit



Fittings

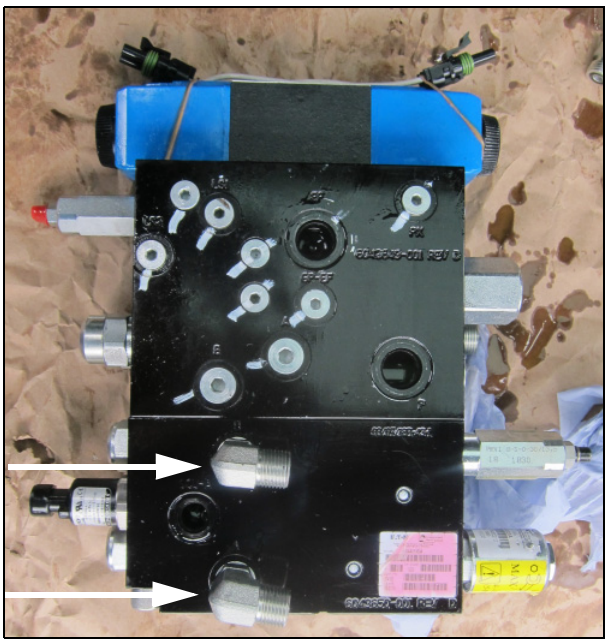
Item	Description	Part number	Quantity
1	Fitting	6 F5OLO	2
2	Fitting	8 F50LO	1
3	Fitting	6 C50LO	2
4	Fitting	8 C50LO	2
5	Fitting	10 R6LO	1
6	Fitting	8 C6LO	2
7	Fitting	8 HLO	2

Hoses

Item	Description	Part number	Line	Quantity
20	39" (99 cm) hose	F451TCJOJS-I0-08-08-39"	P	1
21	36" (92 cm) hose	F451TCJSJS-I0-08-08-36"	EF	1
22	36" (92 cm) hose	F451TCJSJ9-10-08-08-36"	T	1
23	22" (56 cm) hose	F451TCJOJS-08-06-06-22"	A	1
24	22" (56 cm) hose	F451TCJSJS-08-06-06-22"	B	1
25	24" (61 cm) hose	F451TCJSJ9-08-06-06-24"	SCU - A	1
26	18" (46 cm) hose	F451TCJOJI-08-06-06-18"	SCU - B	1

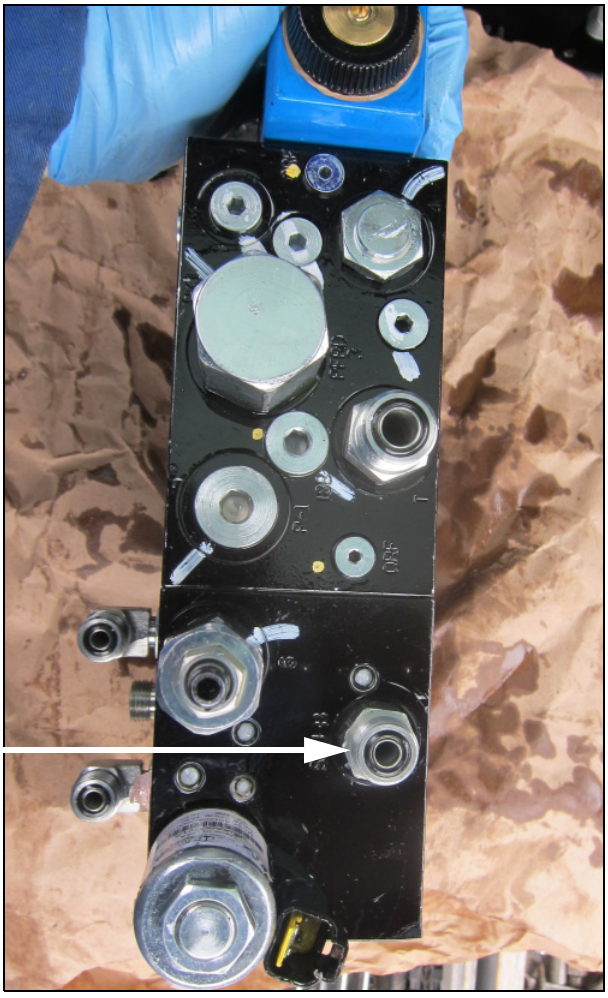
Step 1

Assemble a -06 ORB-ORF 90° fitting into the A and B ports as shown.



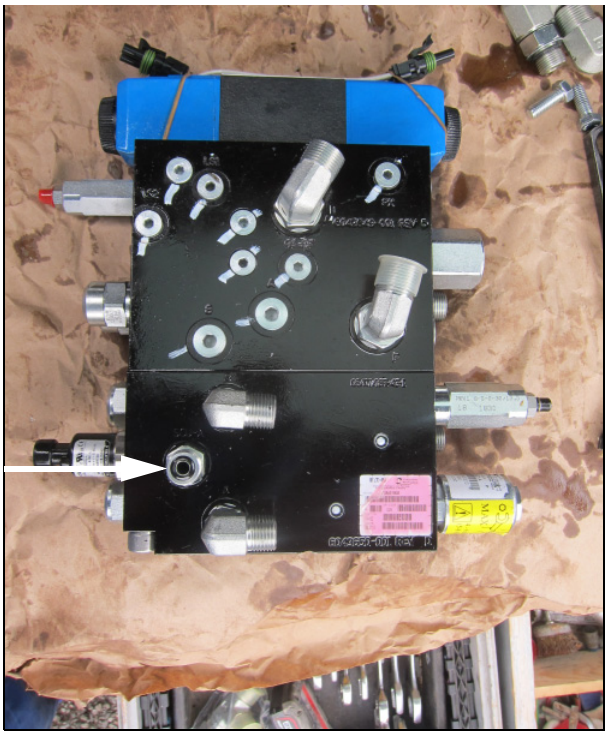
Step 2

Assemble a -06 ORB-ORF straight fitting into the SCU-B port as shown.



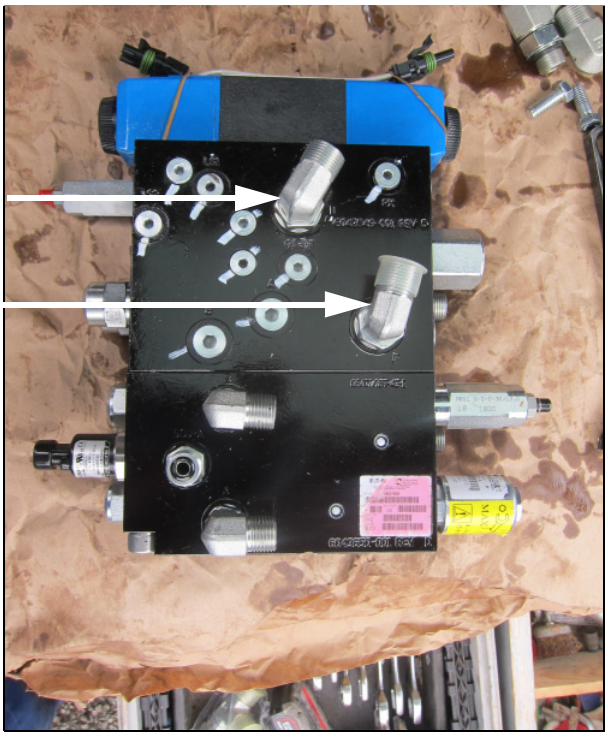
Step 3

Assemble a -06 ORB-ORF straight fitting into the SCU-A port as shown.



Step 4

Insert a -08 ORB-ORF 90° fitting into the P and EF ports as shown.



Step 5

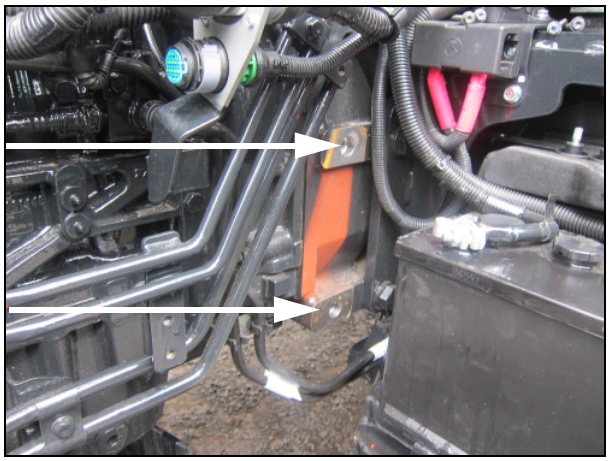
Insert a -08 ORB-ORF straight fitting into the T port as shown.



Mounting the hydraulic manifold—Case Luxxum models

Step 1

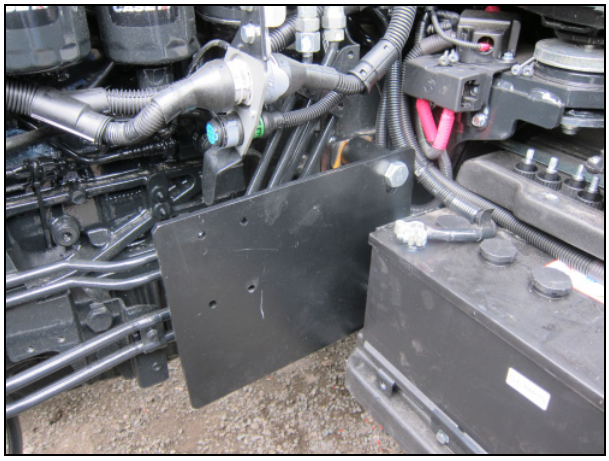
Locate the loader bracket mounting holes on the left side of the machine.



Step 2

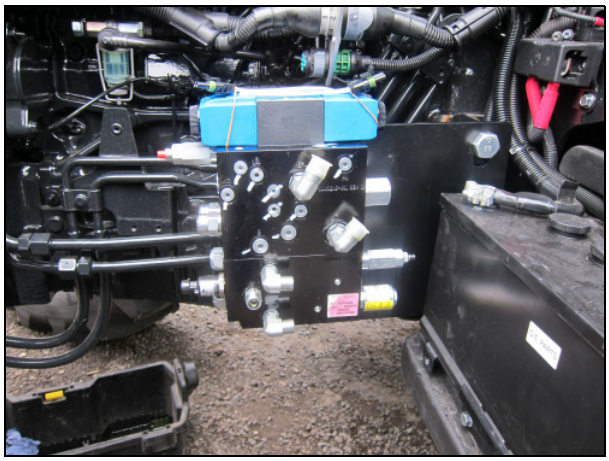
Mount the P/N 119094 bracket to the machine using the provided bolts and spacers as shown.

NOTE – It may be helpful to remove the battery tray cover.



Step 3

Mount the manifold to the bracket using two of the provided 3/8" bolts.



Connecting the hydraulic lines—Case Luxxum models

Machine hydraulic connections

Step 1

Remove the shroud from around the steering orbital.

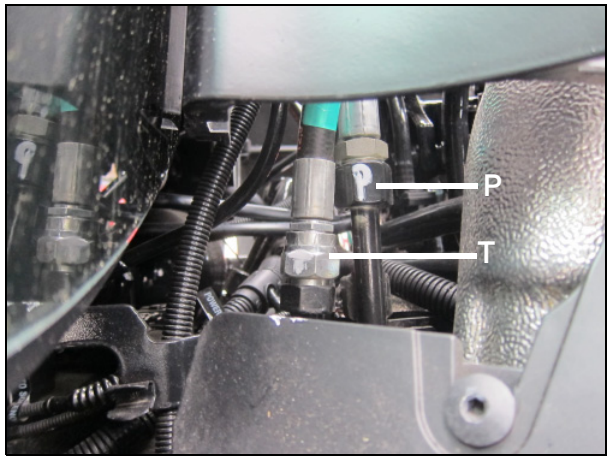


P, EF, and T connections

Step 1

Locate the Pressure (P) and Tank (T) connections on the right side of the machine just in front of the cab.

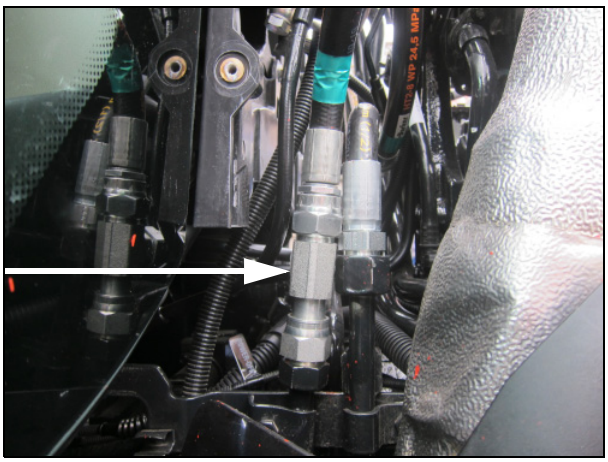
Disconnect the soft lines from the hardlines.



Step 2

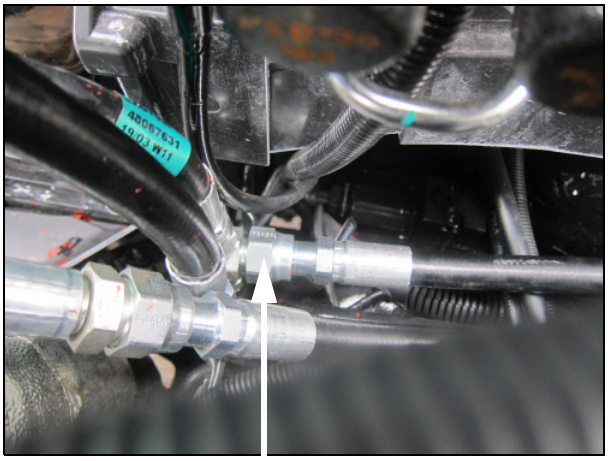
Connect the provided -10 T fitting on the machine Tank line.

Connect the machine Tank hose to the top of the T fitting as shown.



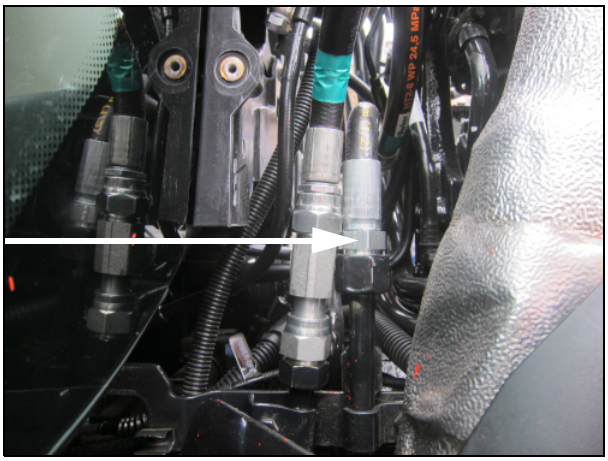
Step 3

Connect the provided Tank line to the branch of the T fitting as shown.



Step 4

Connect the provided P hose to the machine hard line as shown.



Step 5

Connect the provided EF hose to the machine soft line.

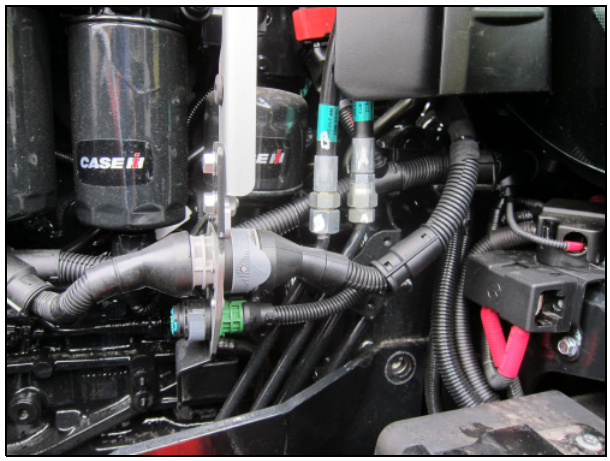


A and B connections

Step 1

Locate the A and B connections on the right side of the machine.

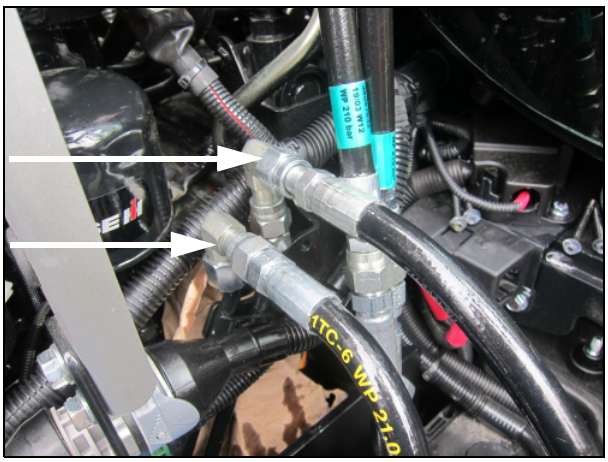
Disconnect the machine soft lines from the hard lines.



Step 2

Install a -08 swivel 90° fitting to the machine hard lines.

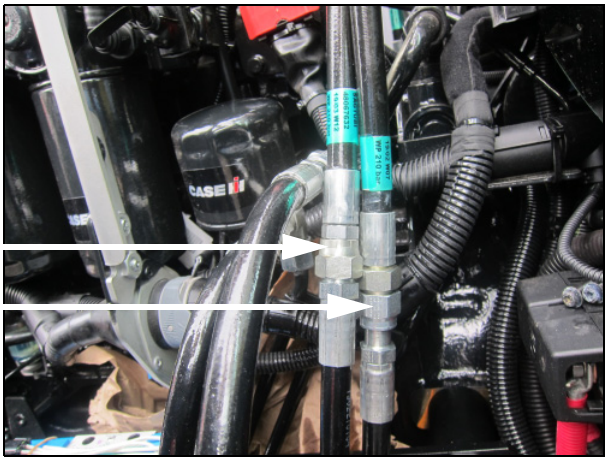
Connect the provided A and B lines to the 90° fittings as shown.



SCU-A and SCU-B connections

Step 1

Connect the provided SCU-A and SCU-B lines to the machine soft lines as shown.



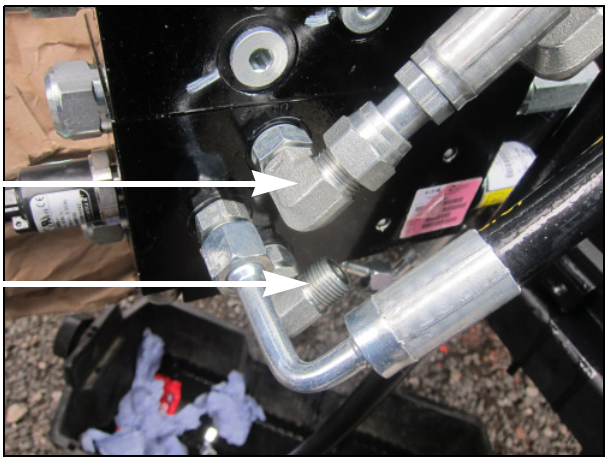
Connecting the Autopilot manifold—Case Luxxum models

⚠ **CAUTION –** Ensure all of the lines are routed so they are not pinched or pulled and do not contact any moving parts on the machine.

A and B connections

Connect the A and B hoses to the A and B ports on the manifold respectively.

NOTE – The A hose is not shown connected.

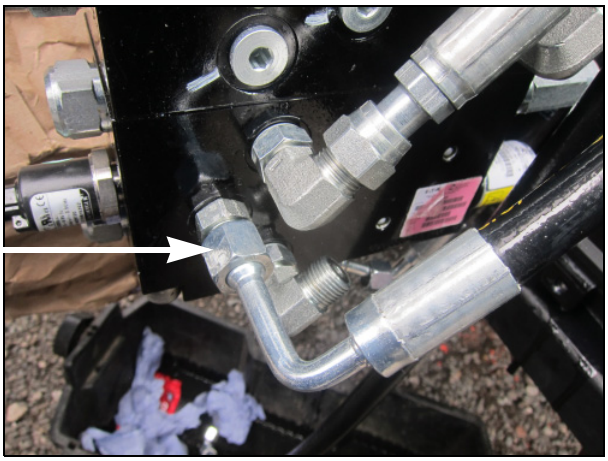


SCU-A and SCU-B connections

Step 1

Connect the SCU-A hose to the SCU-A port of the manifold.

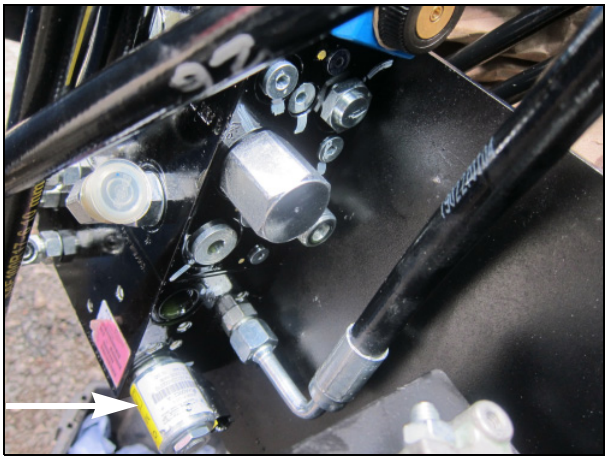
NOTE – A long drop 90° is shown; the hose provided in the hose kit is a standard drop 90°.



Step 2

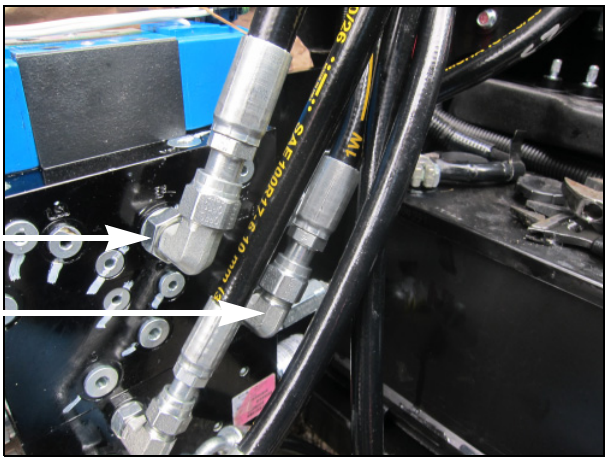
Connect the SCU-B hose to the SCU-B port of the manifold as shown.

NOTE – It may be useful to remove the isolation solenoid cartridge to access the fitting.



P and EF connections

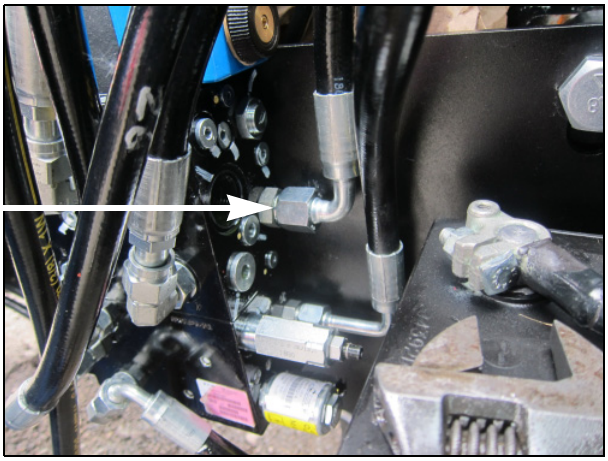
Connect the P and EF hoses to their respective ports on the manifold as shown.



Tank connection

Connect the Tank hose to the T port on the side of the manifold.

NOTE – It may be useful to remove the PFRD cartridge to access the fitting.

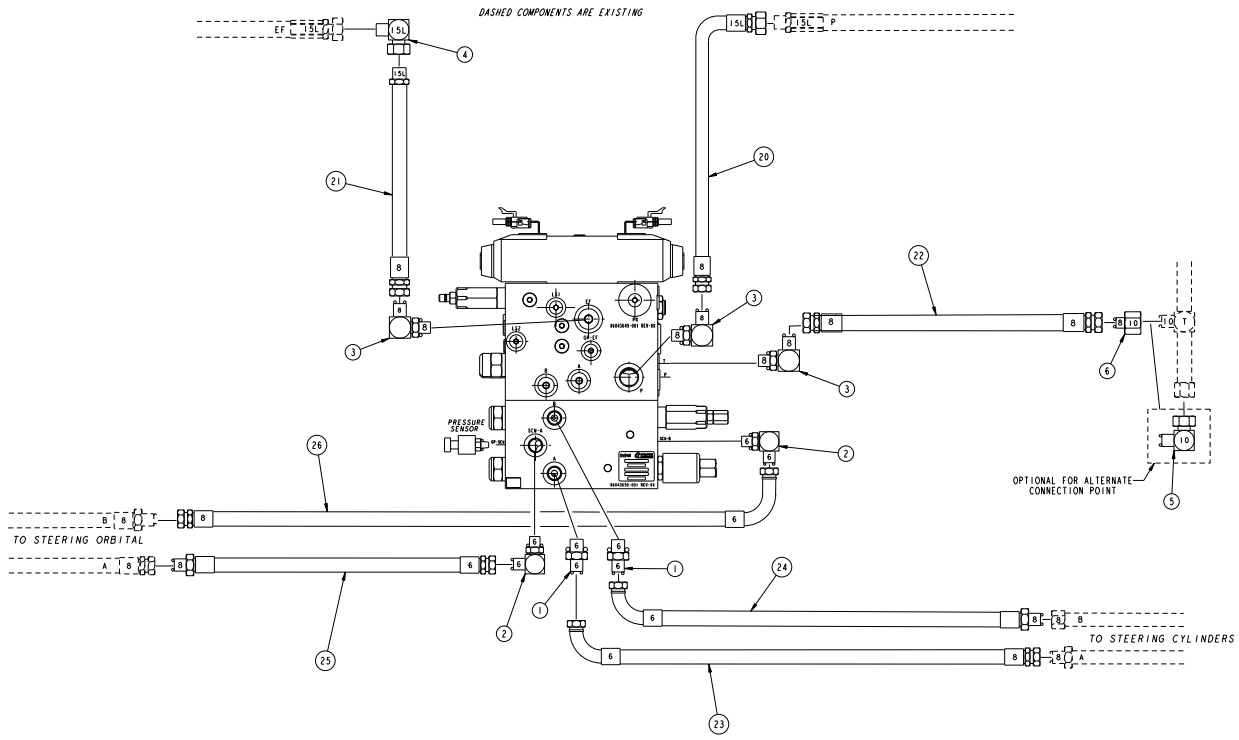


Cable connections on manifold

Connect the valve and manual override cables to the H4 manifold.

For isolation valve connections, see Isolation Models Setup Instructions, page 151.

Hydraulic control valve installation– NH TD5 models - 119164-2000 hose and fitting kit



Fittings

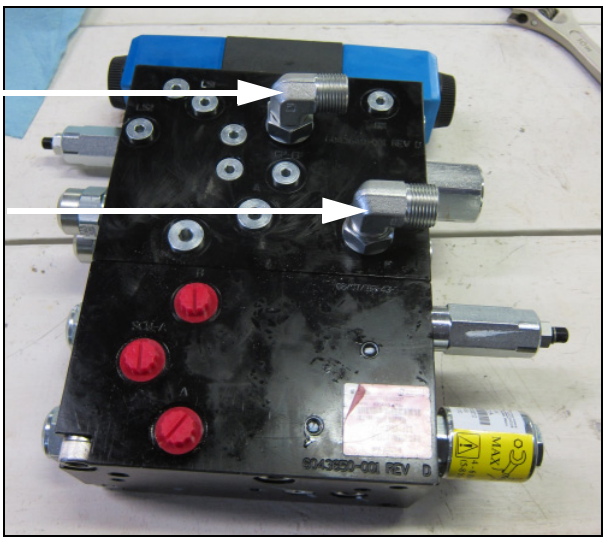
Item	Description	Part number	Quantity
1	Fitting	6 F5OLO	2
2	Fitting	6 C5OLO	2
3	Fitting	8 C5OLO	3
4	Fitting	EW15L	1
5	Fitting	10 C6LO	1
6	Fitting	10-8 TRLON	1

Hoses

Item	Description	Part number	Line	Quantity
20	62" (158 cm) hose	F451TCJSC3-08-15L-08-62"	P	1
21	38" (97 cm) hose	F451TCJSD0-08-15L-08-38"	EF	1
22	38" (97 cm) hose	F451TCJSJS-08-08-08-38''	T	1
23	48" (122 cm) hose	F451TCJSJ9-08-06-06-48''	A	1
24	48" (122 cm) hose	F451TCJOJ9-08-06-06-48"	B	1
25	40" (102 cm) hose	F451TCJOJS-08-06-06-40"	SCU - A	1
26	40" (102 cm) hose	F451TCJSJI-08-06-06-40"	SCU - B	1

Step 1

Assemble an -08 ORB-ORF 90° fitting into the P and EF ports as shown.



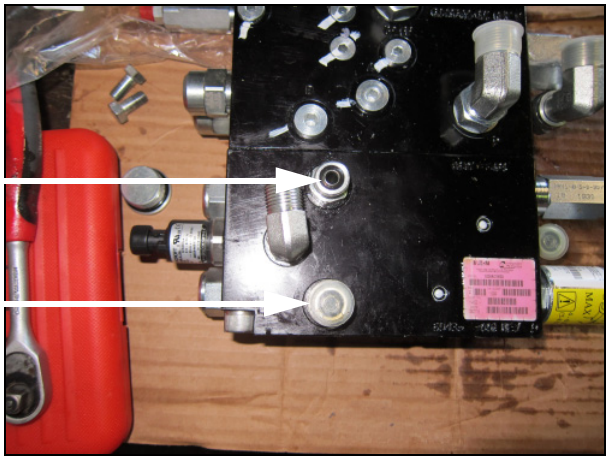
Step 2

Assemble an -08 ORB-ORF 90° fitting into the T port as shown.



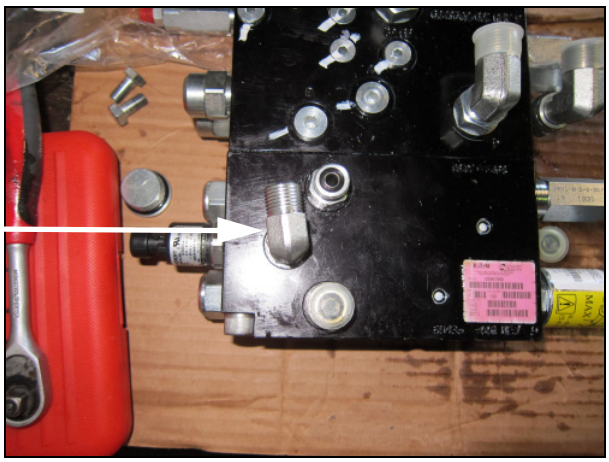
Step 3

Assemble an -06 ORB-ORF straight fitting into the A and B ports as shown.



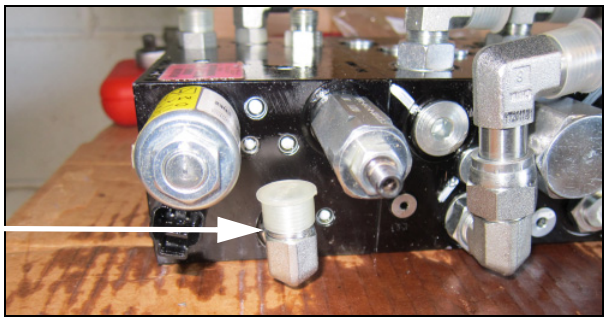
Step 4

Assemble an -06 ORB-ORF 90° fitting into the SCU-A port as shown.



Step 5

Assemble an -06 ORB-ORF 90° fitting into the SCU-B port as shown.



Mounting the hydraulic manifold

NOTE – Shown with previous generation of manifold but the new manifold is mount in the same manner.

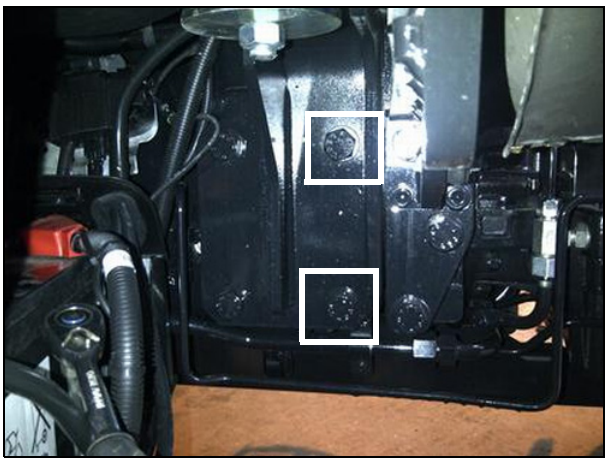
Step 1

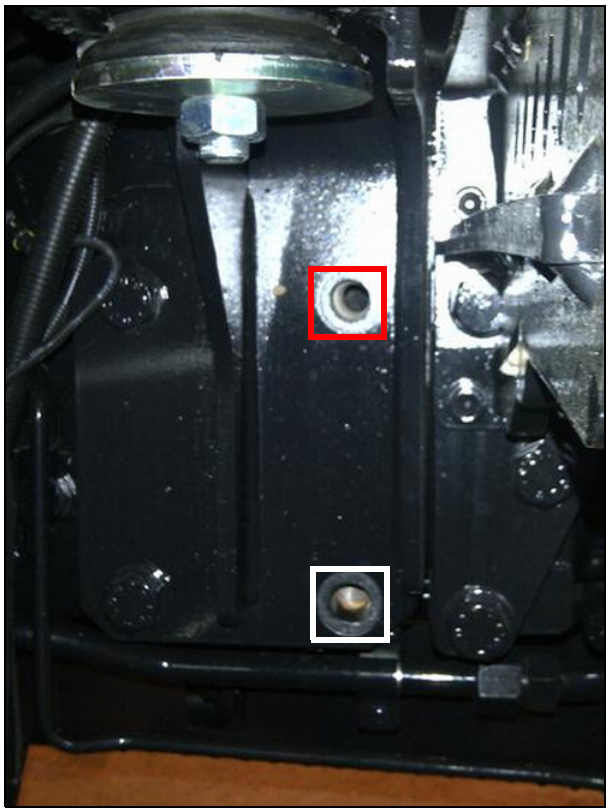
Install the Autopilot manifold on the right hand side of the cab in the location shown here.



Step 2

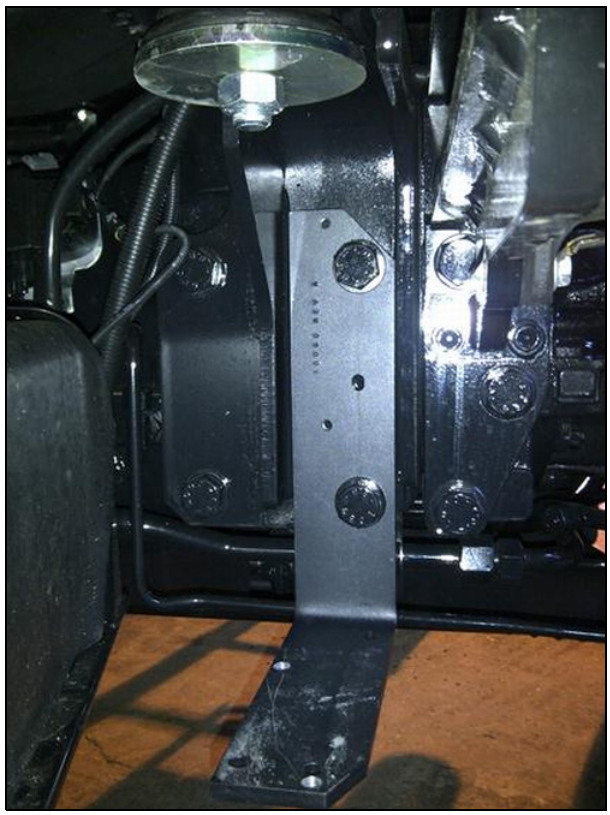
Remove the two bolts shown for mounting the Autopilot manifold mounting bracket to the machine.





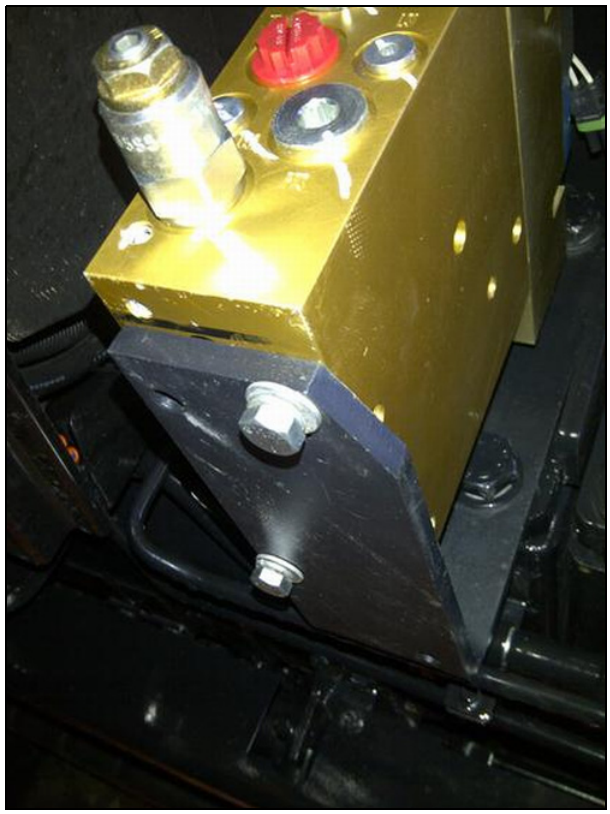
Step 3

Use the bolts that you removed in Step 2 to install the Autopilot mounting bracket to the machine.



Step 4

Use the provided $^{3}/_{8}$" bolts and hardware to attach the Autopilot manifold to the mounting bracket.



Valve bracket alterations for suspended cab models

The following changes may be required if the install location shown in previous steps is blocked due to the suspended cab. The bracket will need to be altered to allow the valve to be mounted.

Step 1

Locate the valve mounting bracket. Use a metal cutting saw to cut the side of the bracket with the larger mounting holes. Measure from the bend and cut the bracket at 10 inches.

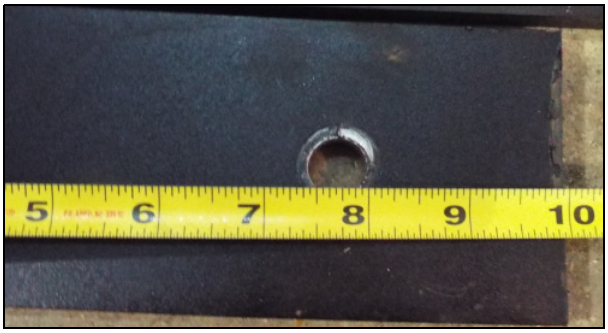
Cut bracket and original bracket shown for reference.



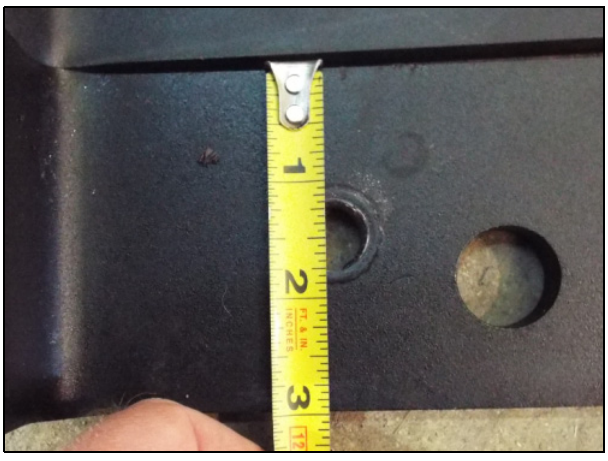
Step 2

Drill two new $^{5}/_{8}$" holes in the cut side of the bracket. The first hole will be centered 2.5" from the bend and 1.5" from the edge of the bracket.



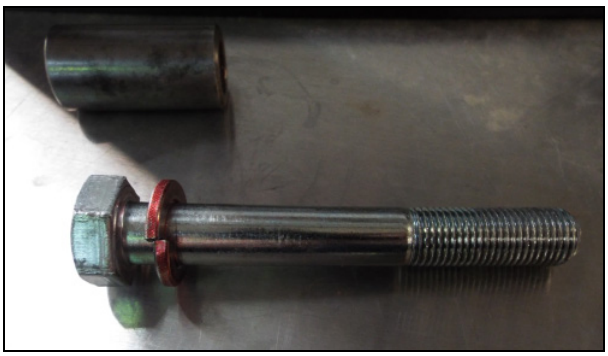


The second hole will be centered 7.75" from the bend and 1.5" from the edge of the bracket.



Step 3

Locate the spacers, lock washers and bolts in hardware kit P/N 117923.



Step 4

Install the bracket in the same location as the previous instructions show. Use parts from P/N 117923 to attach the bracket to the tractor.



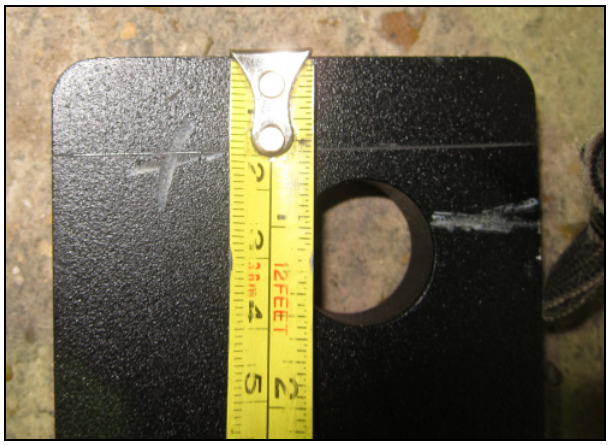
Mounting the hydraulic manifold—New Holland TD5 models

Step 1

Locate the provided P/N 96348 mounting bracket.

Measure and mark 9/16" from the top of the bracket.

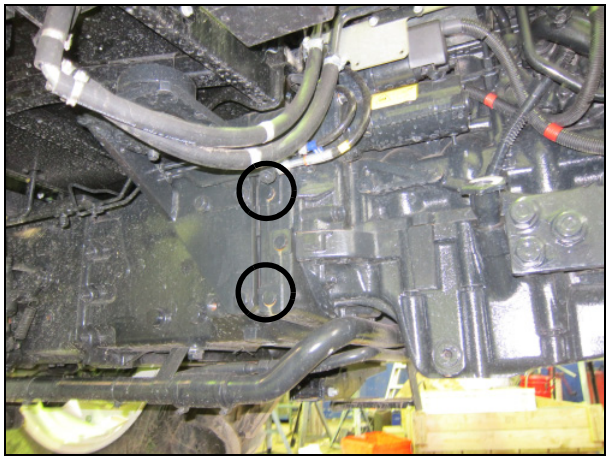
Cut this portion off the bracket.



Step 2

Locate the two mounting holes under the cab on the left side of the machine.

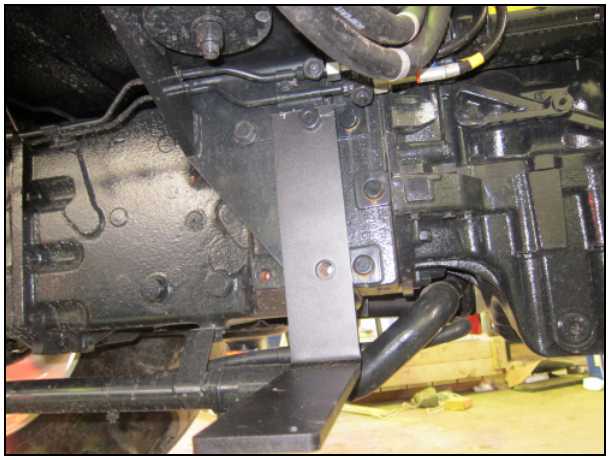
Remove the factory bolts from the machine.



Step 3

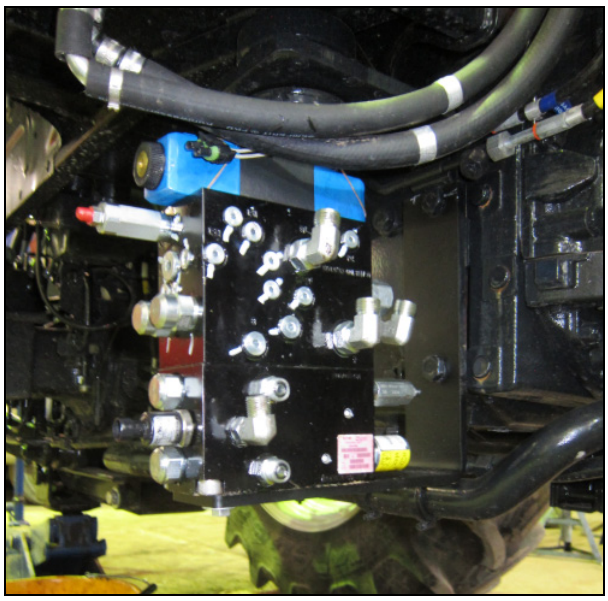
Mount the bracket to the machine using two 5/8"-18 x 1.5" bolts.

NOTE – These bolts are not provided in the bracket kit.



Step 4

Mount the manifold to the bracket using the provided 3/8" bolts.



Connecting the hydraulic lines—New Holland TD5 models

Pressure and EF connections - Option 1

Step 1

Locate the Pressure connection on the left side of the machine just in front of the cab.

Disconnect the soft line from the hardline.



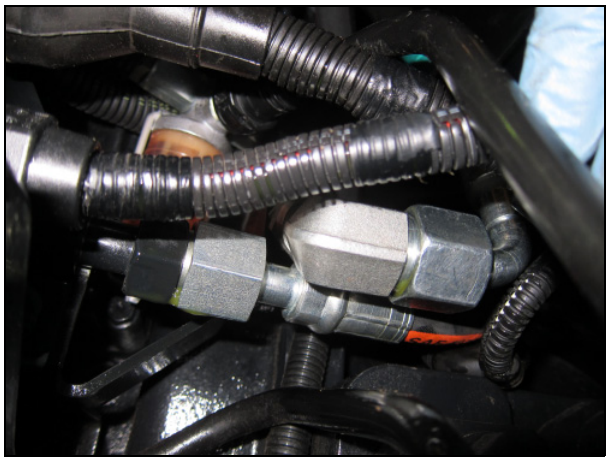
Step 2

Connect a -08 90° fitting to the EF machine soft line, and connect the provided EF hose to the 90° fitting as pictured.



Step 3

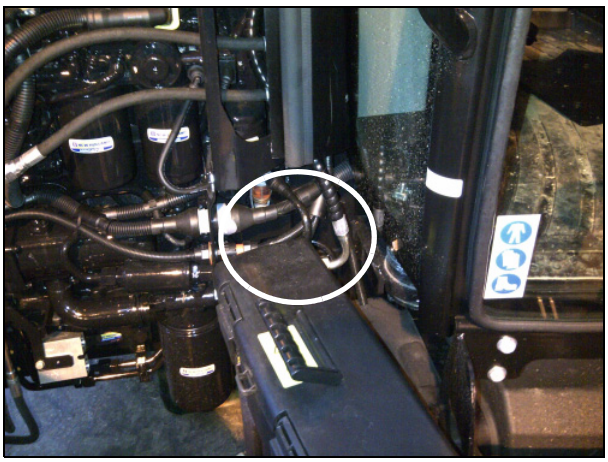
Connect the provided P hose to the machine hard line.



Pressure and EF connections - Option 2

Step 1

The pressure connections are located on the left side of the machine, just in front of the cab.



Step 2

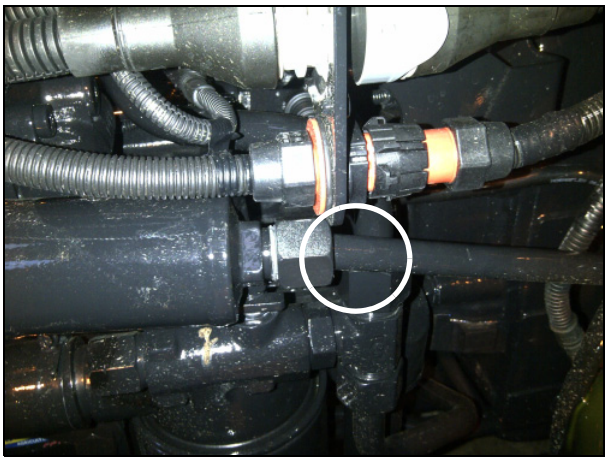
Locate the pressure line going to the existing hand pump on the machine.



Step 3

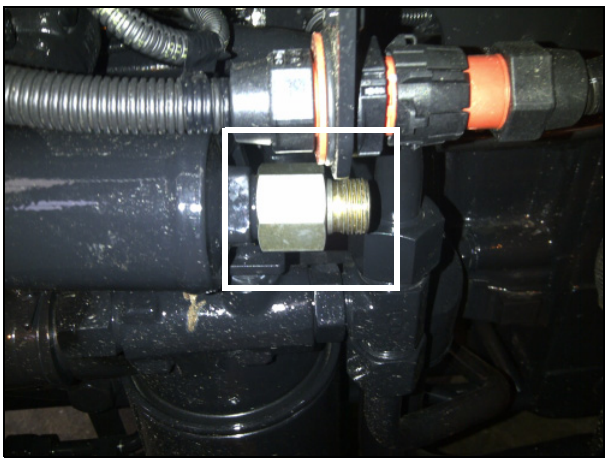
The existing pressure line hose connects to a short steel extension pipe.

Disconnect the machine's P line from the extension pipe and then disconnect the other end of the extension line from the location shown here.



Step 4

Connect the -10-8 reducer to the location where you removed the adapter.

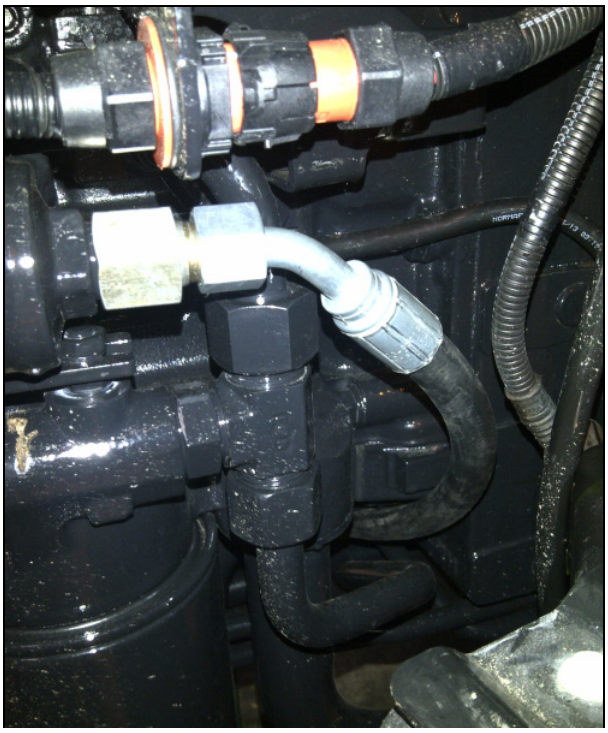


Step 5

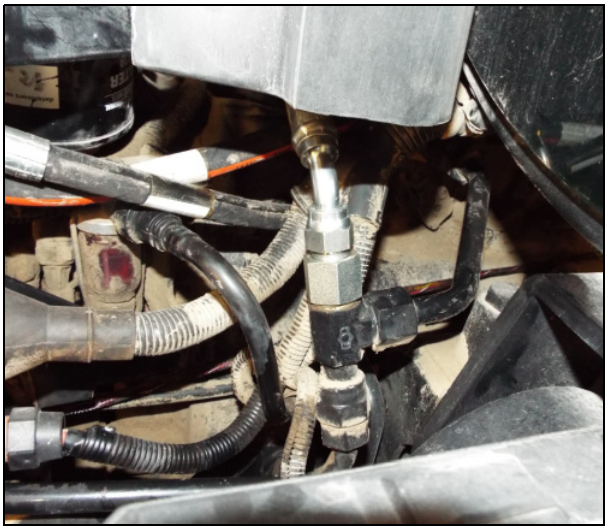
Connect the straight end of the Autopilot P hose to this location.

Route the line to the P port on the Autopilot manifold.

NOTE – The photo shows a 45° hose end but the supplied hose has a straight end.

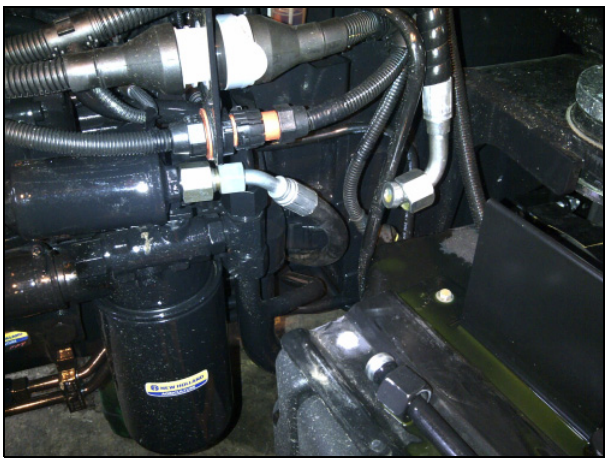


NOTE – If the tractor has a tee fitting located on the pressure connection, then remove the line that would go to the hand pump.



Step 6

Install the provided -10-8 union onto the machine's P line that comes from the hand pump.





Connect the Autopilot manifold's EF line to the union and then run the line between the cab and transmission to the Autopilot manifold.

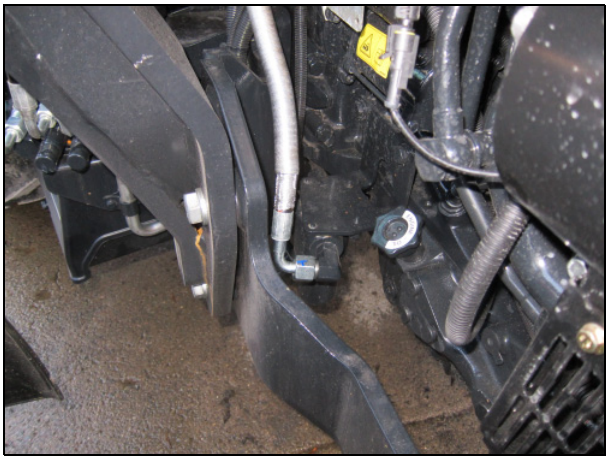


Tank connections - Option 1

Step 1

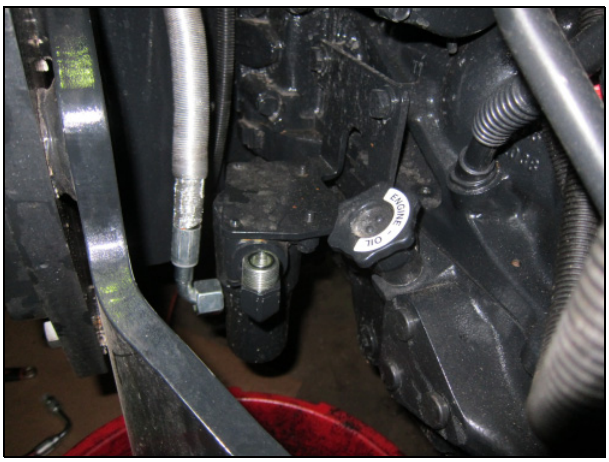
Locate the T connection on the right side of the machine.

Disconnect the machine soft line.



Step 2

Rotate the machine fitting 90° clockwise so that the connection is face straight up as shown.



Step 3

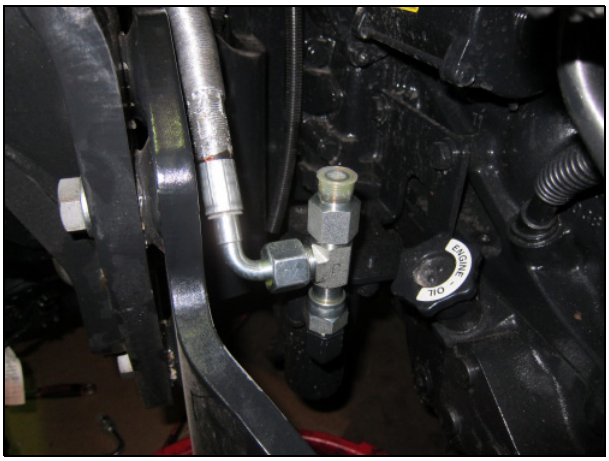
Connect the provided -10 T fitting to the machine fitting as shown.

Connect the -10 to -08 reducer fitting to the top port of the T fitting as shown.



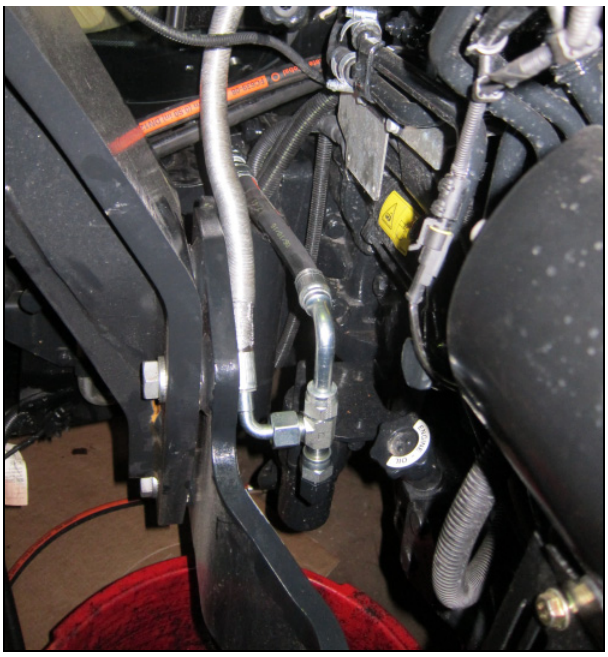
Step 4

Connect the machine line to the port on the side of the -10 T fitting as shown.



Step 5

Connect the provided T hose to the reducer fitting on the top port of the T fitting as shown.



A and B connections

Step 1

Label the steering lines that connect to the steering cylinder **A** and **B**.

Disconnect the soft lines from the machine hardlines.



SCU-A and SCU-B connections

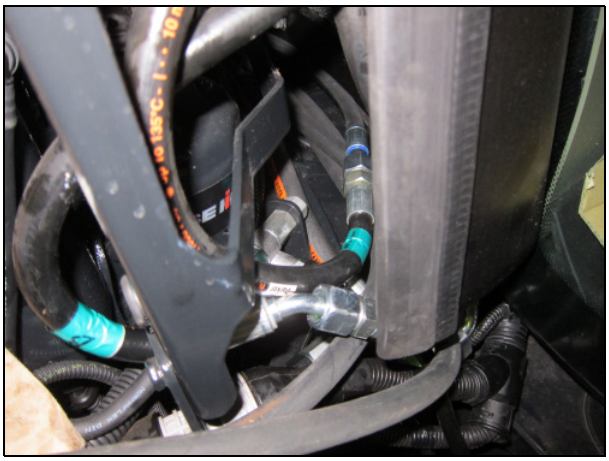
Step 1

Connect the A and B hoses to the machine lines going to the steering cylinder as shown.



Step 2

Connect the SCU-A and SCU-B hoses to the machine soft lines going to the steering pump as shown.



Connections to the manifold

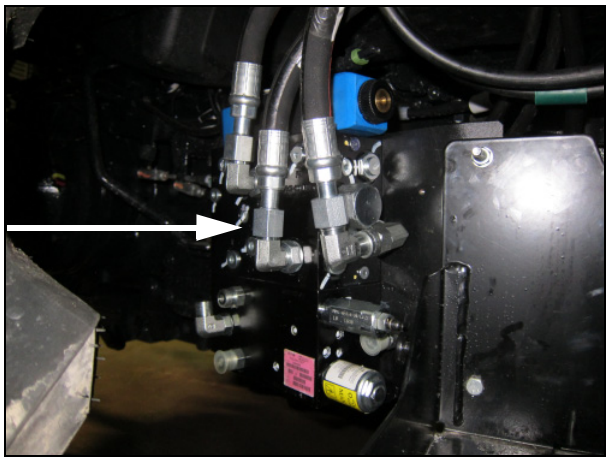
⚠ **CAUTION –** Ensure that all of the lines are routed so they do not contact any moving parts and are not pinched or pulled as the machine is steered left or right.

T and P connections

Step 1

Connect the P hose to the P port on the manifold.

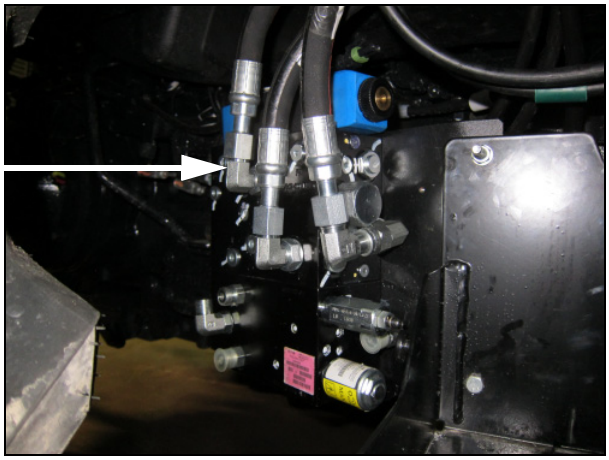
NOTE – For manifold mounting option 1 the orientation of the fittings may need to be adjusted.



Step 2

Connect the EF hose to the EF port on the manifold.

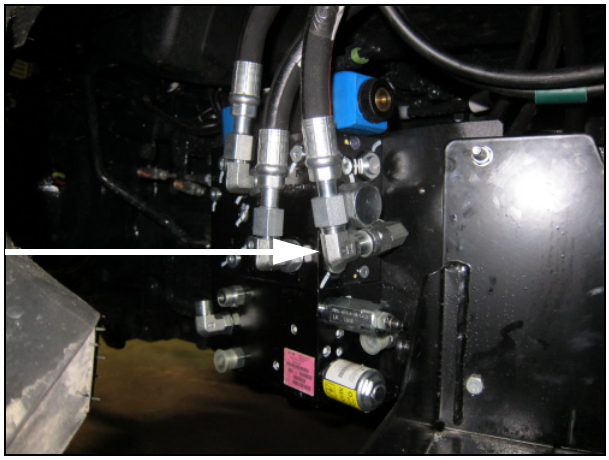
NOTE – For manifold mounting option 1 the orientation of the fittings may need to be adjusted.



Tank connections

Connect the provided -08 Swivel 90° to the T port on the manifold.

Connect the T hose to the swivel 90°.

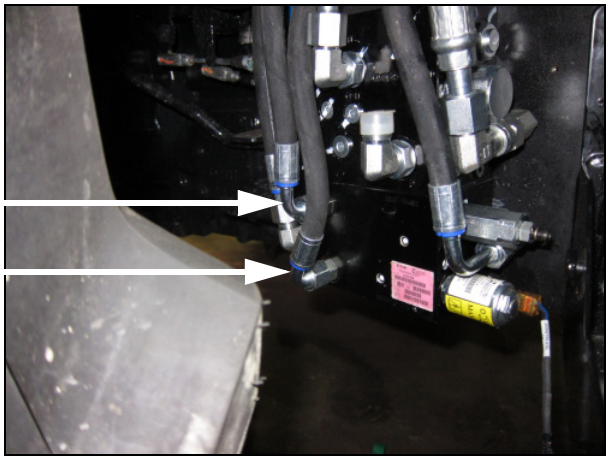


NOTE – Pictured configuration may be different.

NOTE – For manifold mounting option 1 the orientation of the fittings may need to be adjusted.

A and B connections

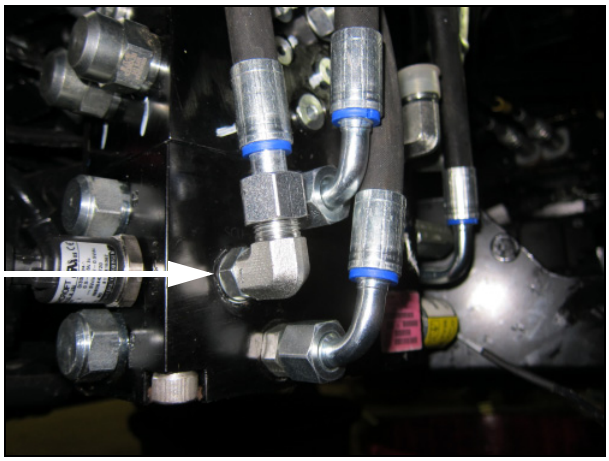
Connect the A and B hoses to the A and B ports on the manifold respectively as shown.



NOTE – For manifold mounting option 1 the orientation of the fittings may need to be adjusted.

SCU-A and SCU-B connections

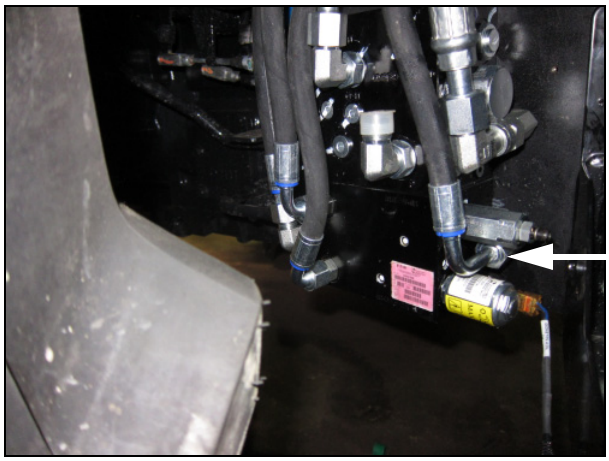
Connect the SCU-A hose to the 90° fitting in the SCU-A port of the manifold.



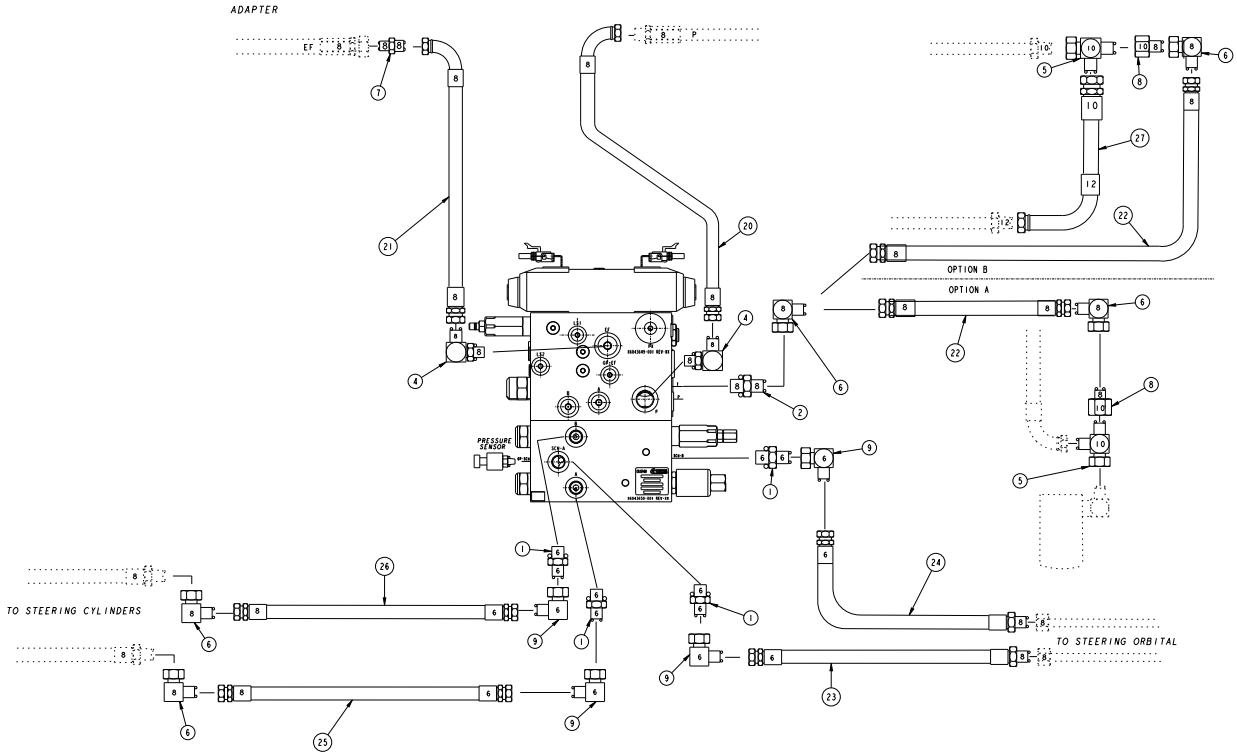
NOTE – For manifold mounting option 1 the orientation of the fittings may need to be adjusted.

Connect the SCU-B hose to the 90° fitting in the SCU-B port of the manifold.

NOTE – For manifold mounting option 1 the orientation of the fittings may need to be adjusted.



Hydraulic control valve installation–NH T5 MY 2020+ and Farmall C Tier 5 models - 119278-2000 hose and fitting kit



Fittings

Item	Description	Part number	Quantity
1	Fitting	6 F5OLO	4
2	Fitting	8 F50L0	1
3			
4	Fitting	8 C5OLO	2
5	Fitting	10 R6LO	1
6	Fitting	8 C6LO	4
7	Fitting	8 HLO	1
8	Fitting	10-8 TRLON	1
9	Fitting	6 C6LO	4

Hoses

Item	Description	Part number	Line	Quantity
20	25" (64 cm) hose	F451TCJSJ9-08-08-08-25"	P	1
21	22" (56 cm) hose	F451TCJSJ9-08-08-08-22"	EF	1
22	67" (170 cm) hose	F451TCJSJS-08-08-08-67"	T	1
23	34" (86 cm) hose	F451TCJOJS-08-06-06-34"	A	1
24	34" (86 cm) hose	F451TCJOJS-08-06-06-34"	B	1

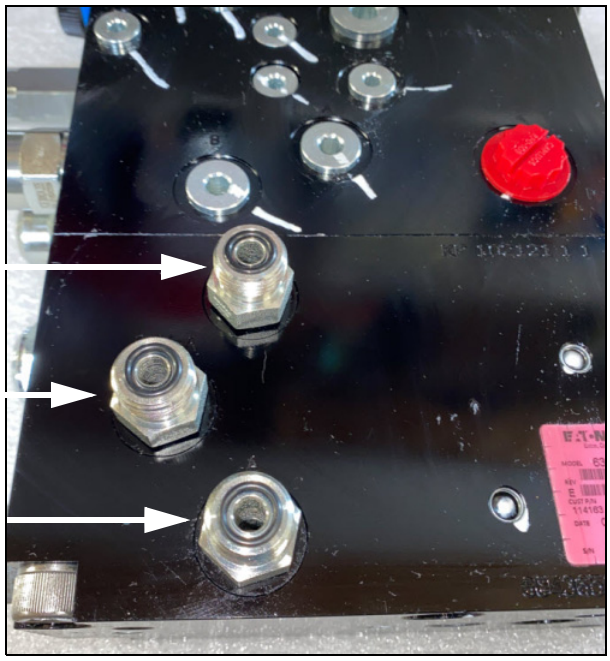
Item	Description	Part number	Line	Quantity
25	23" (59 cm) hose	F451TCJSJS-08-06-06-23"	SCU - A	1
26	33" (84 cm) hose	F451TCJSJS-08-06-06-33"	SCU - B	1
27	12" (30 cm) hose	F451TCJSJ9-10-12-10-12"	Tr	1

Installing the manifold—NH T5 and Farmall C Tier 5 models

⚠ **CAUTION –** Ensure that all of the lines are routed so they do not contact any moving parts and are not pinched or pulled as the machine is steered left or right.

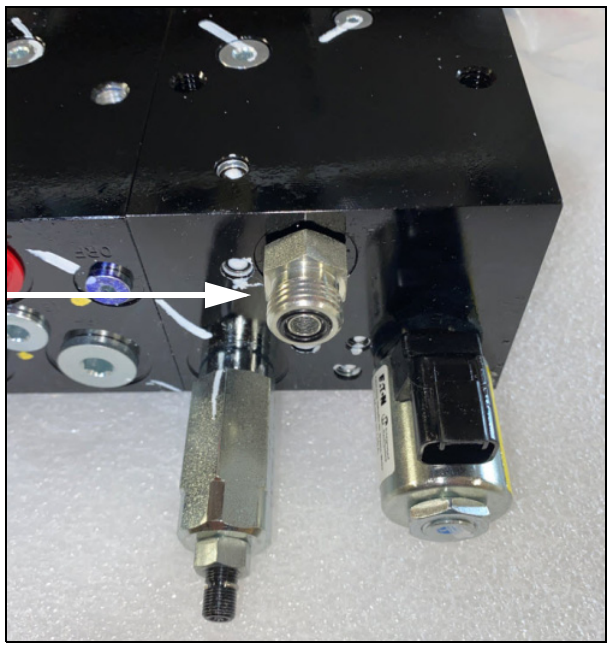
Step 1

Assemble the -06 ORB-ORF fittings into the A, SCU-A, and B ports as shown.



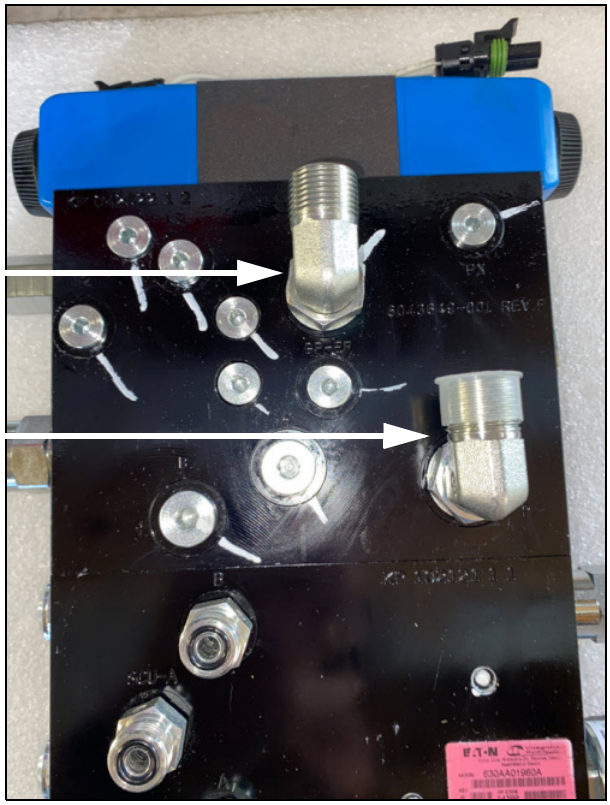
Step 2

Assemble a -06 ORB-ORF straight fitting into the SCU-B port as shown.



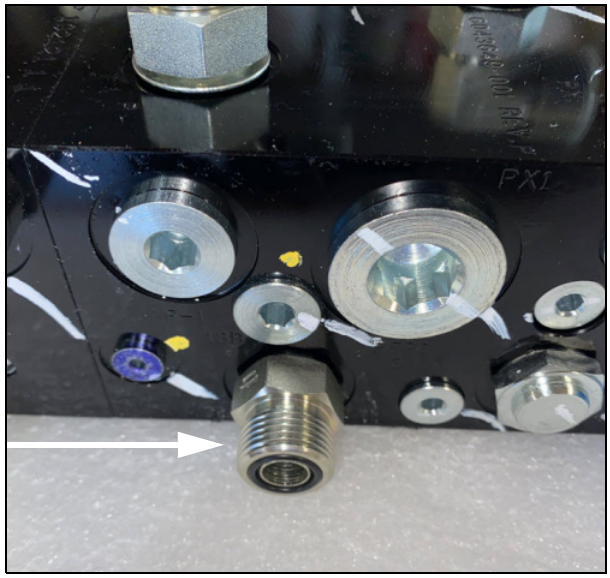
Step 3

Insert a -08 ORB-ORF 90° fitting into the P and EF ports as shown.



Step 4

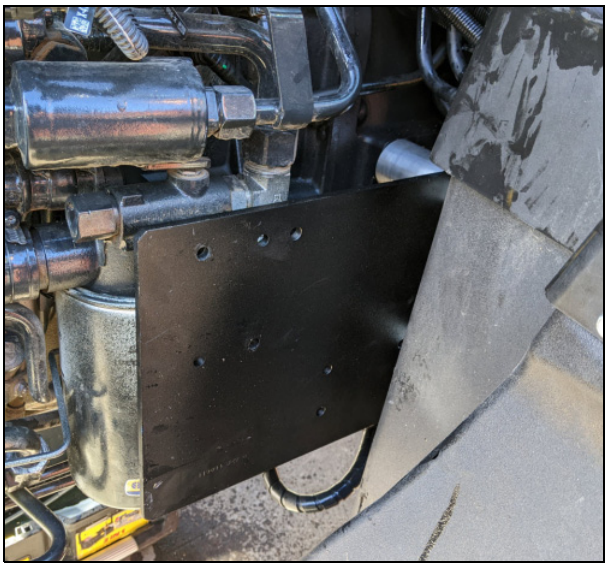
Insert a -08 ORB-ORF straight fitting into the T port as shown.



Mounting the hydraulic manifold—NH T5 models

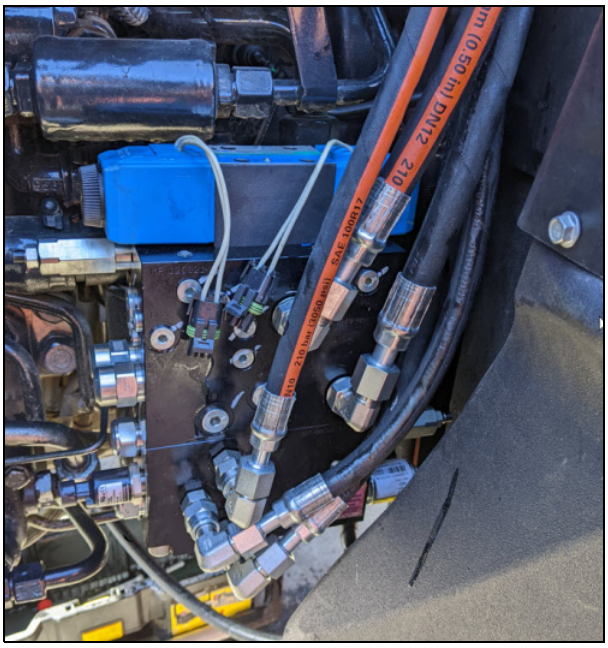
Step 1

Mount the P/N 119094 bracket to the machine using the provided bolts and spacers as shown.



Step 2

Mount the manifold to the bracket using two of the provided 3/8” bolts.



Mounting the hydraulic manifold—Farmall C Tier 5 models

Step 1

Locate the tractor bracket on the left side of the tractor near the front of the cab.



Step 2

Use the supplied hardware to secure the P/N 119094 bracket to the mounting location shown in the previous step.



Step 3

Use the supplied hardware to attach the valve and manifold to the mounting plate.



Connecting the hydraulic lines— NH T5 and Farmall C Tier 5 models

P and EF connections

Step 1

Locate the Pressure connection on the left side of the tractor, just in front of the cab. The left and right hose connections are in the same area below the pressure connection.

Disconnect the Pressure hose fitting.



Step 2

Locate the supplied pressure hose.

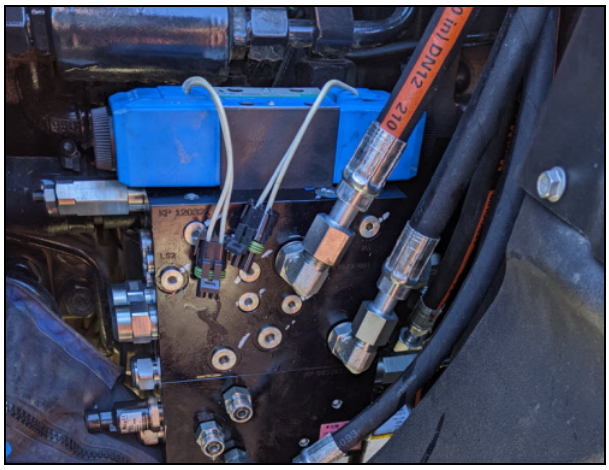
Connect the 90° fitting on the pressure hose to the tractor where the tractor pressure hose was disconnected from in the previous step.

NOTE – Picture shows 90° crimp on hose fitting. However, the kit includes a 90° swivel fitting and a straight crimp on the hose fitting.



Route the other end of the pressure hose to the Autopilot manifold.

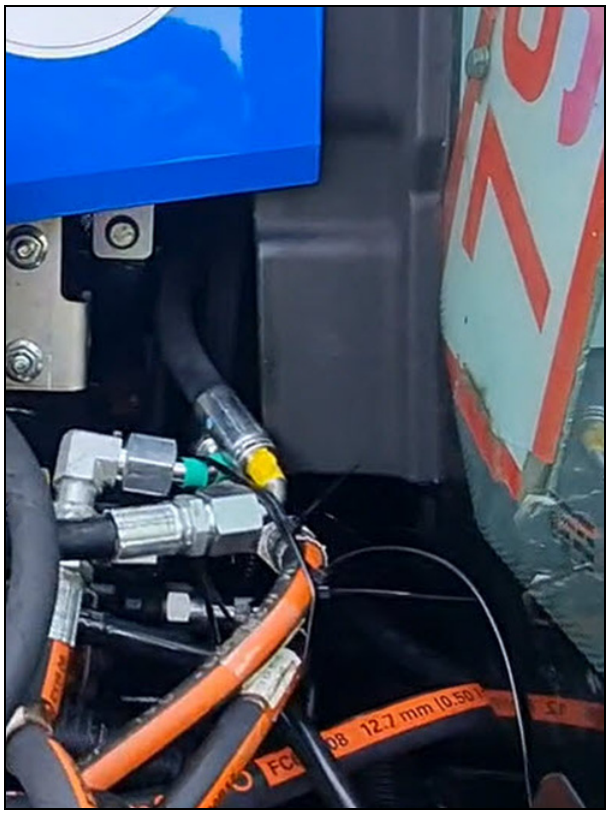
Connect the pressure hose to the 90° fitting in the manifold P port.



Step 3

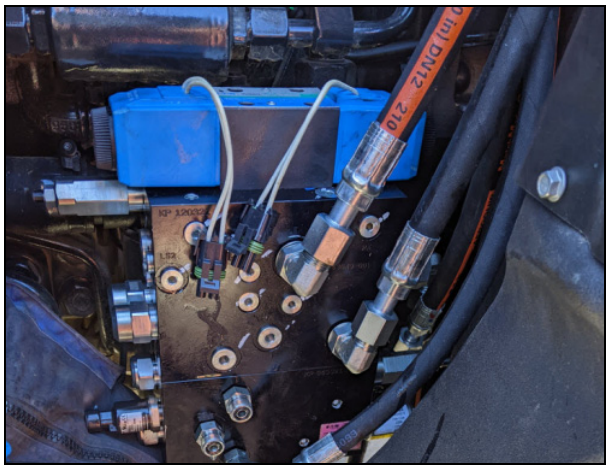
Locate the supplied EF hose.

Connect the 90° fitting on the EF hose to the tractor pressure hose that was disconnected in the earlier step. A -08 to -08 male union is provided to connect the two hoses.



Route the other end of the EF hose to the Autopilot manifold.

Connect the EF hose to the 90° fitting in the manifold EF port.

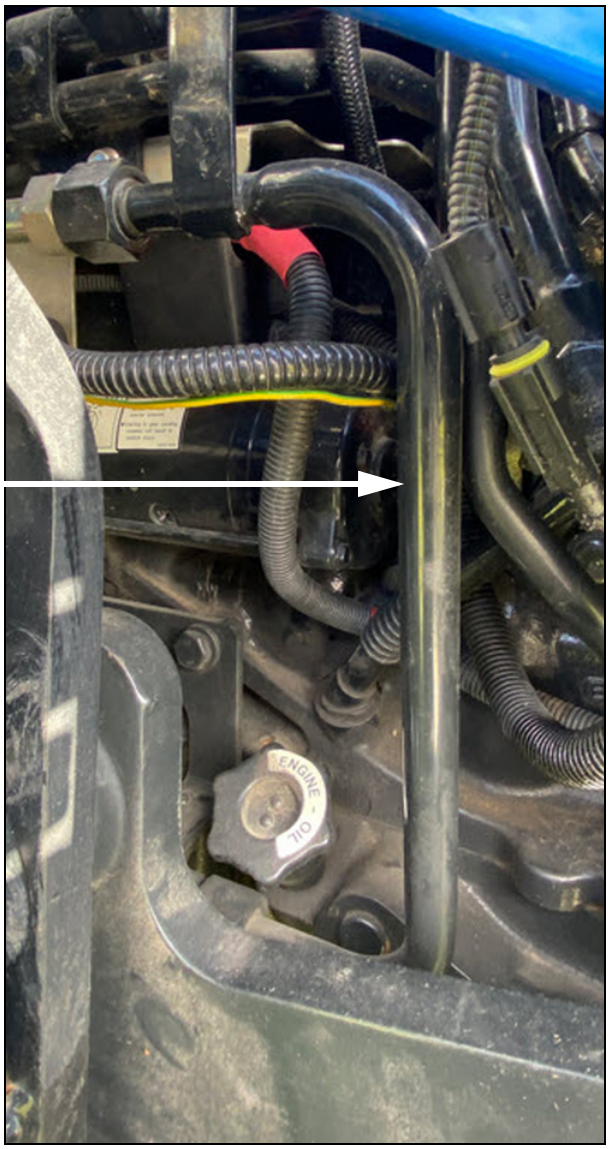


T connection–Option 1

Step 1

The tank connection on the machine is located on the right side of the machine just in front of the exhaust pipe at the side of the engine.

To connect the Autopilot manifold, you must remove the existing hard line.



Step 2

Assemble the -10 run tee fitting onto the location shown and then attach the -10 to -08 reducer to the tee, followed by the -08 90° union onto the end of the run tee fitting.



Step 3

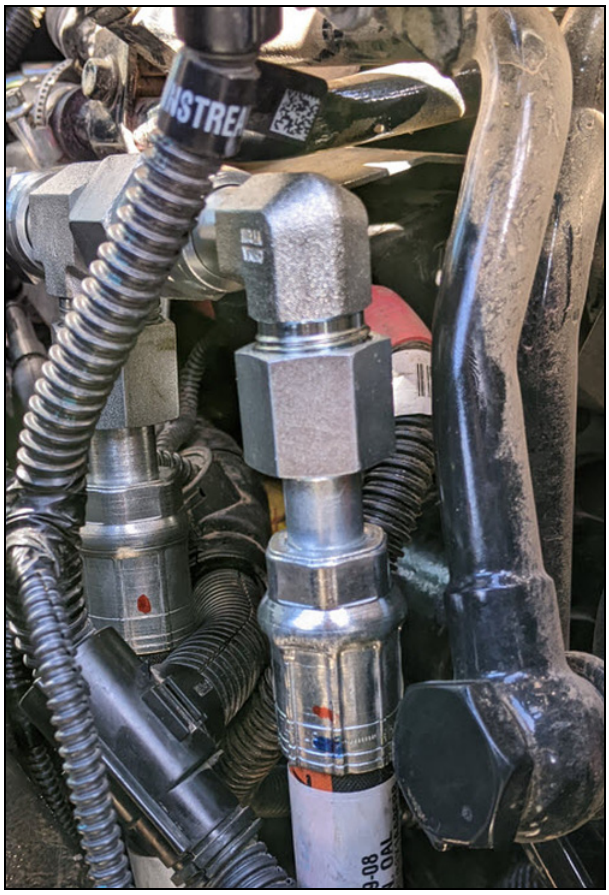
Connect the long drop 90° end of the T hose to the location where the machine's steel line was removed previously (at the bottom of the machine).



Step 4

Connect the straight end of the hardline tank replacement hose to the bottom of the tee fitting installed in the earlier step.

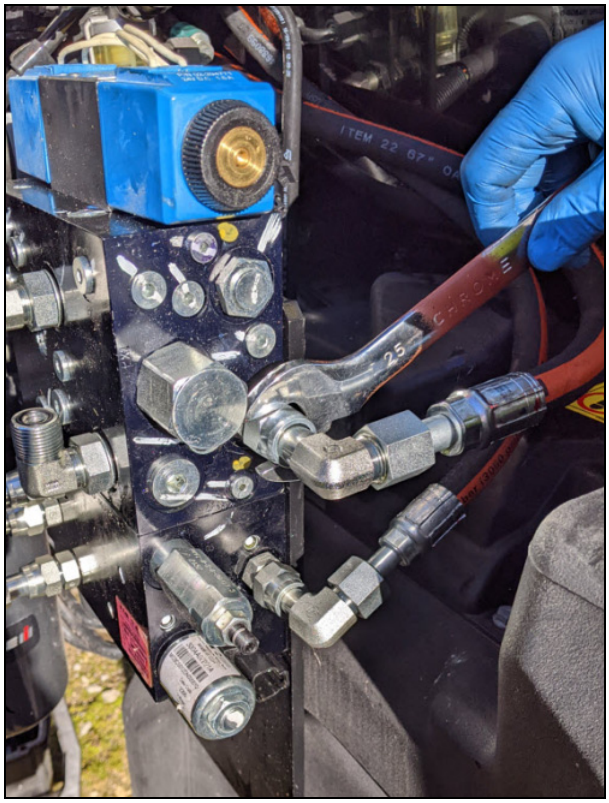
Connect the straight end of the tank hose to -08 90° adapter on the end of the run tee.



Step 5

Route the other end of the tank line to the T port on the Autopilot manifold.

Connect the hose to the T port using the supplied 90° fitting.

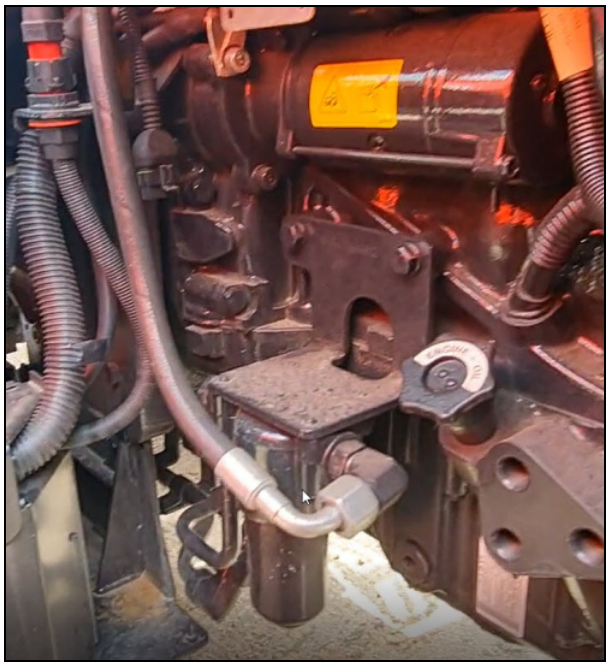


T connection–Option 2

Step 1

Locate the T connection on the right side of the machine.

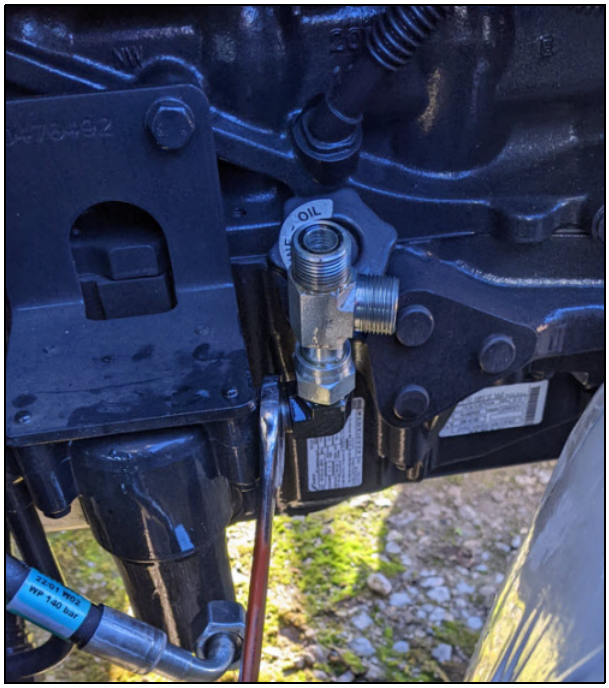
Disconnect the machine soft line.



Step 2

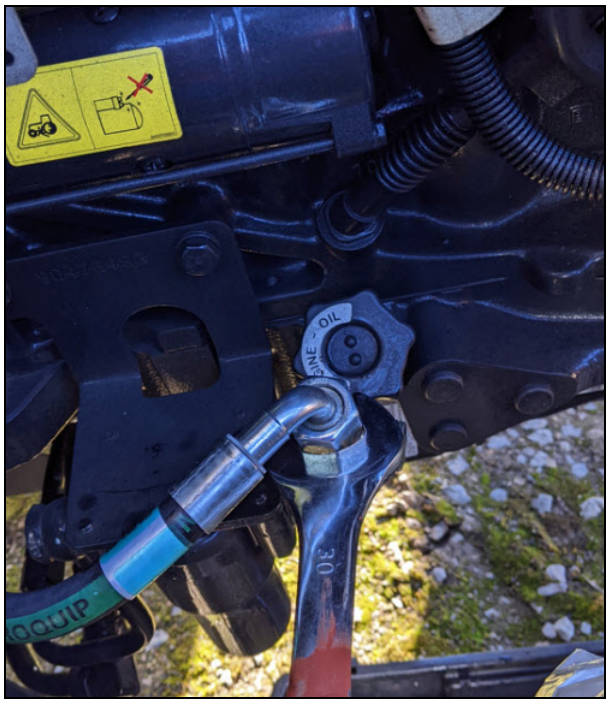
Rotate the machine fitting 90° clockwise so that the connection is face straight up.

Connect the provided -10 T fitting to the machine fitting as shown.



Step 3

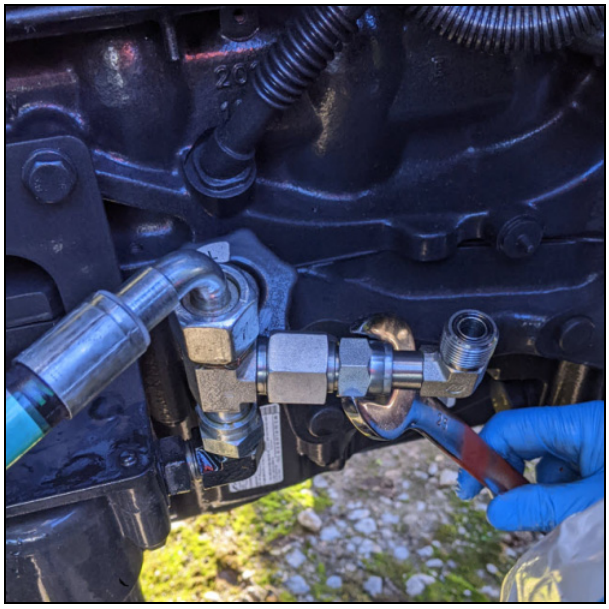
Connect the machine line to the port of the -10 T fitting as shown.



Step 4

Connect the -10 to -08 reducer fitting to the tee.

Connect the -08 90° adapter to the reducer.



Step 5

Connect the supplied tank hose to the 90° fitting and then route the other end of the hose to the Autopilot manifold.



Step 6

Connect the tank hose to the supplied 90° adapter and then to the T port on the Autopilot manifold.

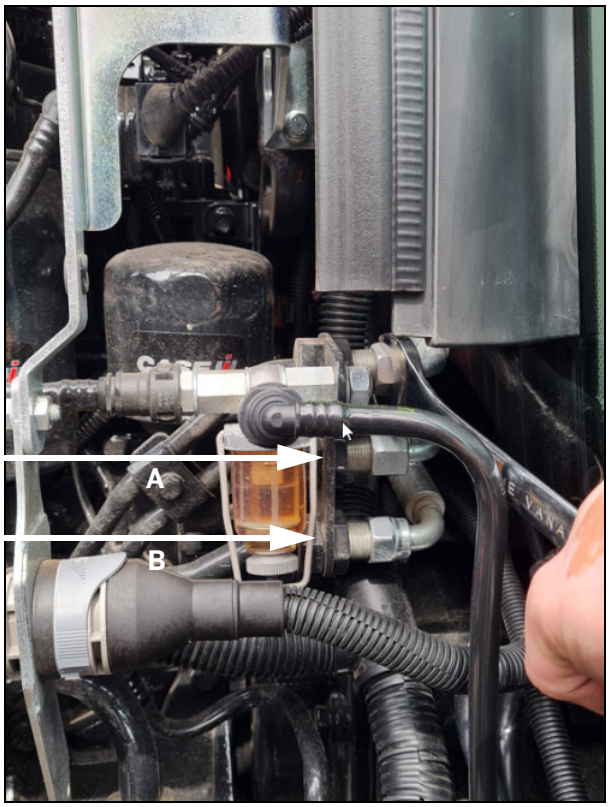


A and B connections

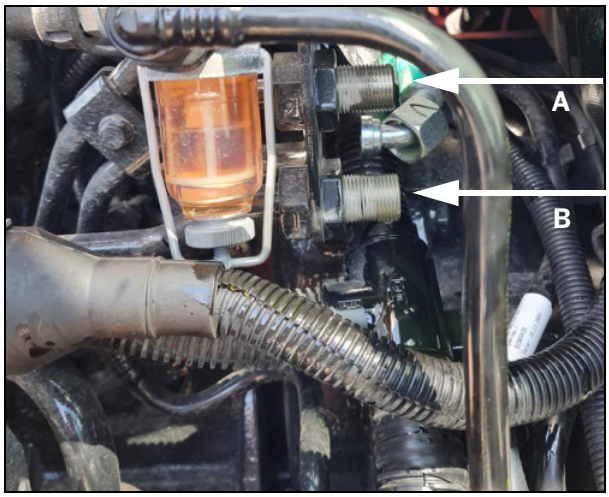
Step 1

Locate the A and B connections on the left side of the tractor, just in front of the cab. The left and right hose connections are in the same area below the pressure connection.

Mark each hose and fitting with different color tape or something to distinguish between the A and B hoses once they are disconnected.



Disconnect the A and B hose fitting.



Step 2

Locate the supplied A and B hoses and -08 90° adapters.

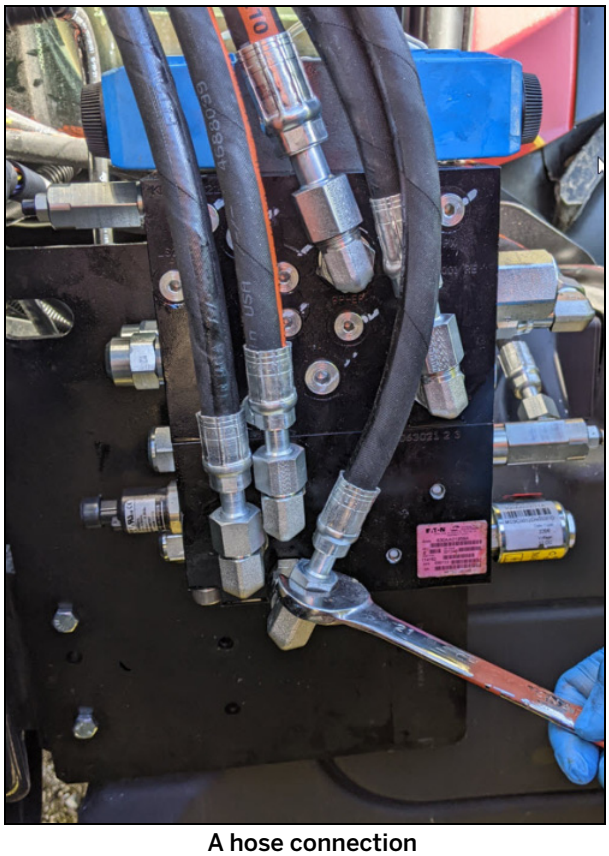
Connect the A and B hoses using the 90° adapters to the tractor fittings where the A and B hoses were removed in the previous step.

NOTE – Picture shows 90° crimp on hose fittings. However, the kit includes 90° swivel fittings and a straight crimp on fitting on the hoses.



Step 3

Connect the other end of the A and B hoses to the A and B ports on the Autopilot manifold.



A hose connection



B hose connection

SCU-A and SCU-B connections

Step 1

Locate the SCU-A and SCU-B hoses.

Connect the male end of the hose to the A and B hoses removed in the earlier step.

Route the other end of the hoses to the Autopilot manifold.



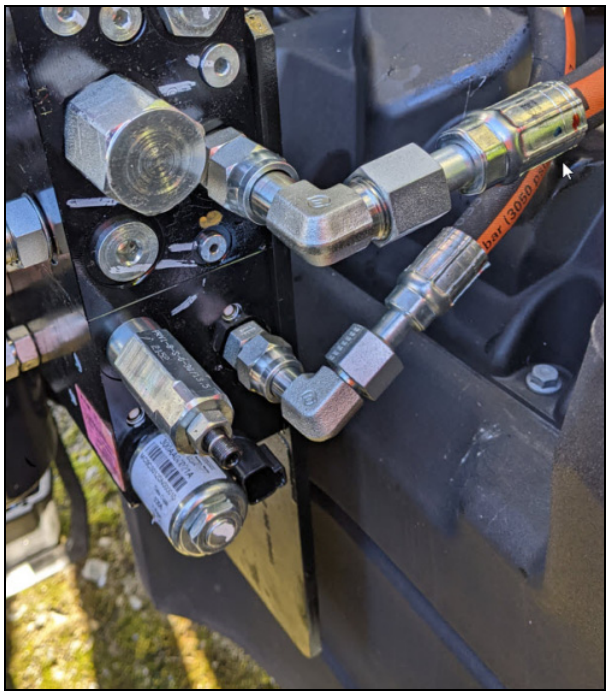


Step 2

Connect the SCU-A and SCU-B hoses to the SCU-A and SCU-B ports on the Autopilot manifold.



SCU-A hose connection



SCU-B hose connection

3

IMD-900 Steering Device Installation

- IMD-900 steering device components
- Installing the IMD-900 steering device—Case Luxxum
- Installing the IMD-900 steering device—Farmall C Tier 5, NH T5.xxx, and NH TD5
- Connecting the IMD-900 harness to the 54602 harness

This chapter describes how to install the IMD-900 module steering device. If the described mounting location is not accessible, chose a different place.

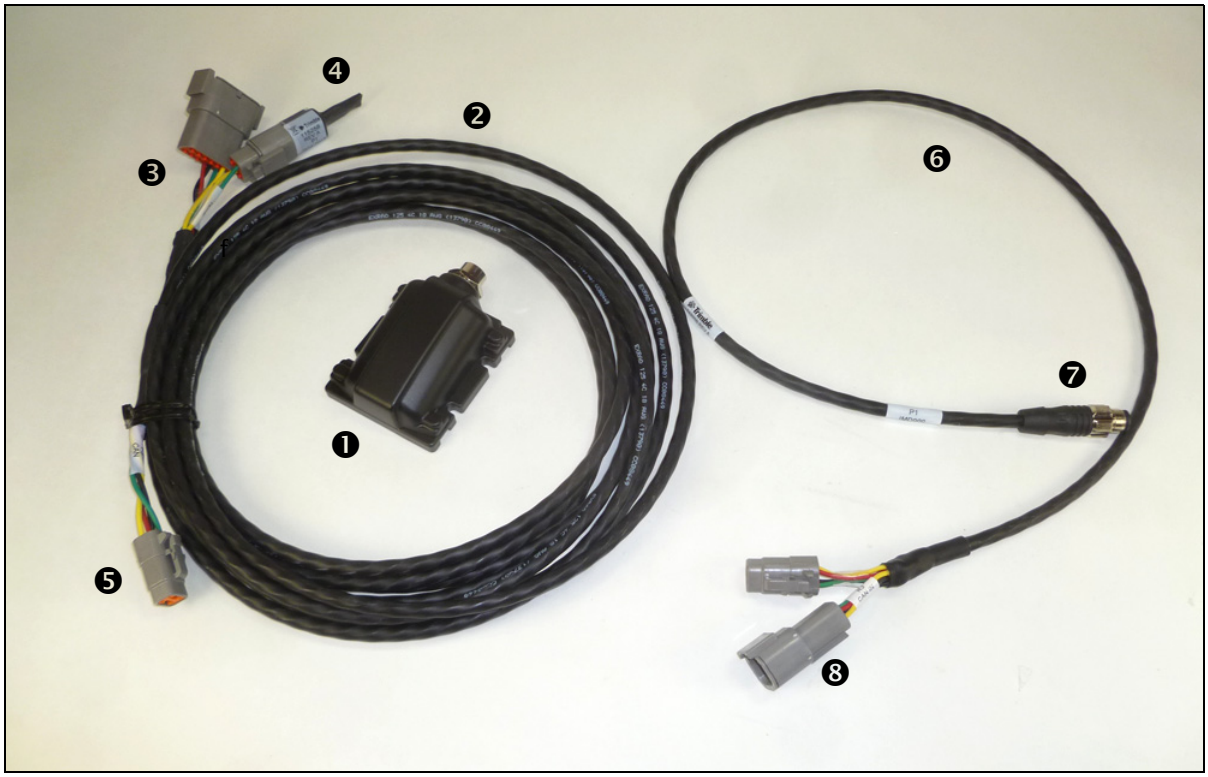
To ensure proper function, the IMD-900 device must be located where it is free of obstructions and can rotate with the wheels when they turn.

On articulated vehicles, mount the IMD-900 device on the opposite side of the pivot point to the Autopilot controller.

Mount the device base down or base up so that it maintains a level orientation. Do not mount it on its side. An angle of up to 10° in any direction is acceptable, but as flat as possible is recommended.

To avoid stretching the cable, leave adequate length on the service loop.

IMD-900 steering device components



Item	Description
1	IMD-900 steering sensor (P/N 109256-00)
2	Cable (P/N 114675)
3	R1-CAN connector
4	CAN terminal (× 2)
5	P3 CAN connector
6	Cable (P/N 112759)
7	P1-IMD-900
8	P3/R3 CAN out/CAN in

Installing the IMD-900 steering device—Case Luxxum

⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

The new IMD-900 steering device is shown on the right. Install it using the following steps.



NOTE – Some of the photos show the AutoSense™ mounting but the new IMD-900 steering sensor will mount in the same manner.

Step 1

Locate the two bolts on the front of the steering knuckle. Remove these bolts.



Step 2

Using the bolts that you just removed, mount the AutoSense bracket to the machine.

Attach the IMD-900 to the AutoSense bracket in an orientation that allows the cable to be ran along the axle.

Connect the IMD-900 cabling to the AutoSense sensor.



Step 3

Route the IMD-900 cabling to the NavController.

> ⚠ **CAUTION –** Make sure the cable does not touch any moving parts, and is not pinched as the wheel steers from right to left.



Installing the IMD-900 steering device—Farmall C Tier 5, NH T5.xxx, and NH TD5

⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

The new IMD-900 steering device is shown on the right. Install it using the following steps.



Step 1

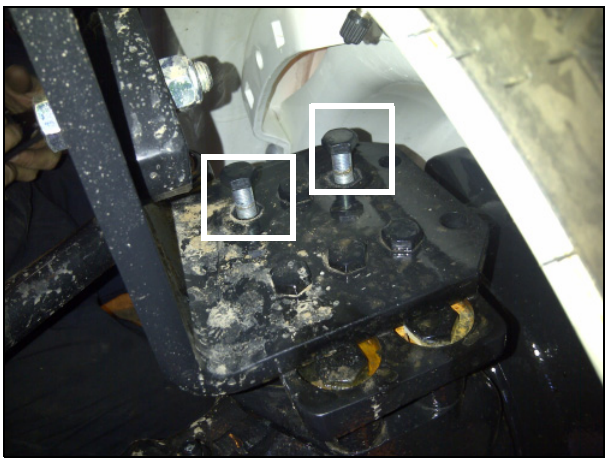
NOTE – An older version is pictured. The new IMD-900 steering sensor will install the same way as the AutoSense sensor shown here.

Locate the mounting position: The IMD-900 device will be installed on the fender mount bracket on the left front wheel of the machine.



Step 2

Remove the two bolts shown here so that you can mount the mounting plate of the IMD-900 device.



Step 3

Use the provided socket head screws to attach the IMD-900 steering sensor device to the mounting plate and then attach the mounting plate to the machine using the provided spacers and washers and the bolts removed in the previous step.

NOTE – The IMD-900 steering sensor will install to the mounting plate in the same manner as the AutoSense, pictured right.



Step 4

⚠ **CAUTION –** Make sure that the cable is not pinched or pulled as the wheels are steered from full right to full left and that the cabling does not contact any hot or moving components on the machine.

Attach the cabling to the IMD-900 device and then route the cable to the NavController harness.

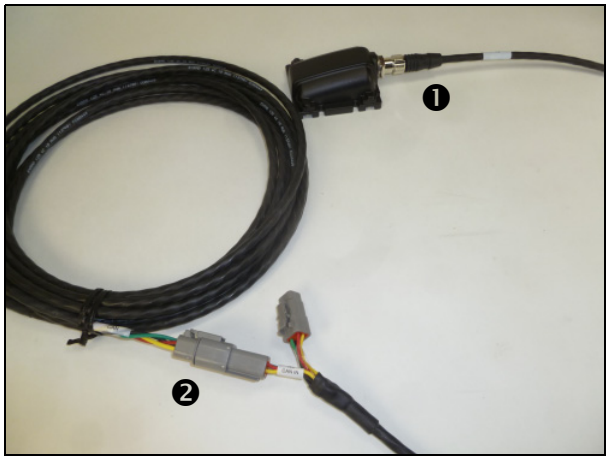


Connecting the IMD-900 harness to the 54602 harness

Step 1

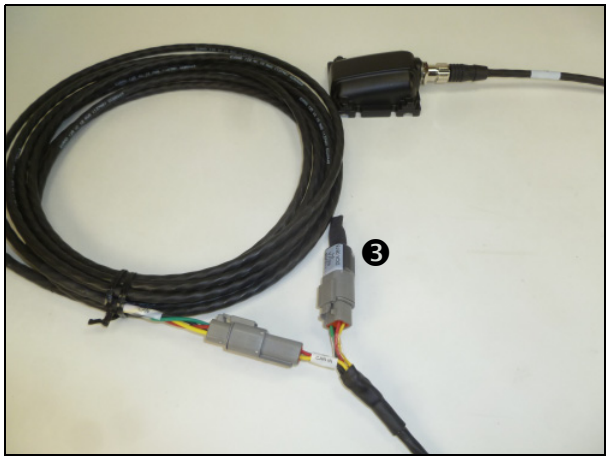
Connect the P1 connector of the 112759 cable to the IMD-900 ❶.

Connect the R3 connector to the 114675 cable ❷.



Step 2

Connect the CAN terminal to the P3 connector of the 112759 cable ❸.



Step 3

With the cable routed to the NavController, connect the R1 connector to the P12 connector on the 54602 harness on the NavController as shown.

Attach a terminator next to the P12 connection.



4

Antenna / Receiver Installation

- Antenna and receiver installation options
- Installing the NAV-900 guidance receiver using a spar mount
- Optional: Using the P/N 110308 for quick release mounting of the NAV-900 from the spar
- NAV-900 guidance receiver: Connecting the cables— both methods
- NAV-900 guidance receiver: Connecting an external radio (as required)

This chapter describes how to install the required receiver and antenna, and radio module (if used). To install the antenna for the display, see Chapter 5, Display Installation.

Antenna and receiver installation options

There are several options for mounting components (the antenna, radio module, or GNSS receiver) on the cab roof depending on the accuracy required and the antenna type:

- **VHB mount** – Attach a P/N 62034 plate or a V plate directly to the roof with VHB (Very High Bond) adhesive for magnetic mounting. See page 79.
- **Magnetic mounting** – Magnetic mounting for quick release is available for both VHB and spar type mounting.

Possible mounting methods

GNSS receiver	VHB mounted plate	VHB V mounted plate
CFX-750 display TM-200 module	✓	✓

NOTE – For WAAS, EGNOS, OmniSTAR VBS, Beacon, and DGPS applications, place either of the plates in a firm location using the VHB.

Attaching the plate with VHB adhesive

⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

Standard P/N 62034 plates are provided in most kits. You can use the VHB mounting method to attach either a P/N 62034 plate or a V plate.

- **RTK, OmniSTAR, DGPS, GLONASS applications** – To use this method for high accuracy, the surface must be rigid and free of “oil panning”. For RTK or OmniSTAR HP corrections, the spar method is recommended. The V plate provides repeatable positioning of the antenna.
- **WAAS, EGNOS, OmniSTAR VBS, Beacon applications** – Use a P/N 62034 plate for simplified installation in applications where high accuracy is not critical.

Step 1

Clean the antenna location on the roof of the cab with a light solvent to remove oil and dust. Apply force to the roof to find a firm location.

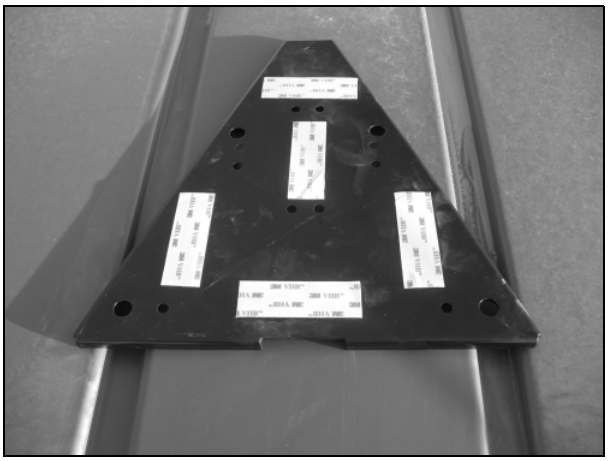


Step 2

V plate only

Remove the backing from one side of the VHB strips provided and then apply the strips to the plate.

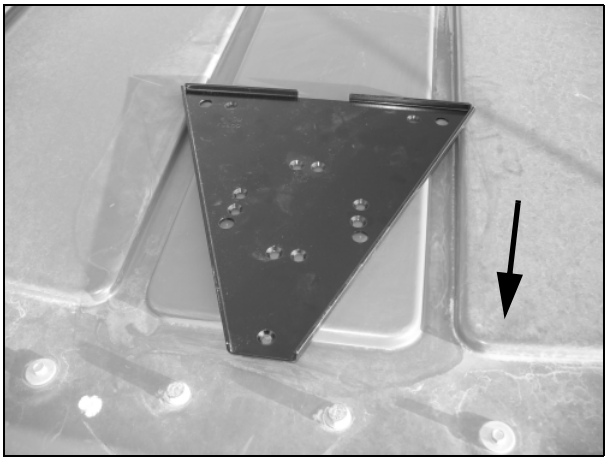
NOTE – The VHB strips are pre-applied to the P/N 62034 plate.



Step 3

Remove the backing from the other side of the VHB strips and then apply the plate to the cab roof. The narrow end of the plate points forward. Ensure that the VHB strips make even contact with the surface. Apply pressure and then leave for approximately 30 minutes to adhere.

NOTE – The arrow points to the front of the vehicle.



V plate



P/N 62034

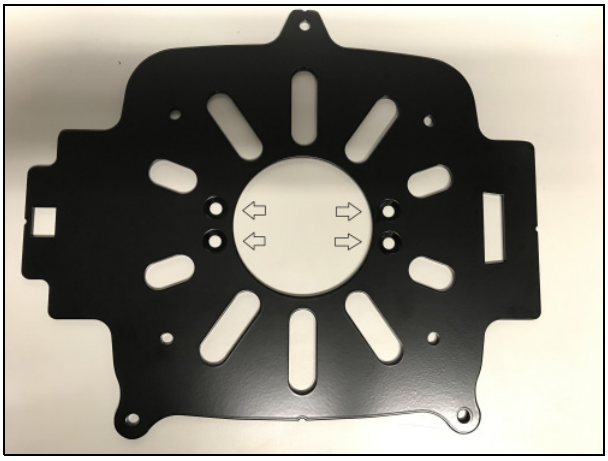
Installing the NAV-900 guidance receiver using a spar mount

For vehicles that do not have factory mounting methods or the factory mounting method is already in use, spar mounts are available to span between rigid bolts on the roof.

Lengths available are:

- P/N 64898: 16.5” – 28.5”
- P/N 55349: 27.5” – 37.5”
- P/N 53676: 36.5” – 46.5”
- P/N 55348: 45” – 55”
- P/N 66774: 54” – 64”

The guidance controller plate has a four-bolt pattern that directly attaches to the spar mounts:



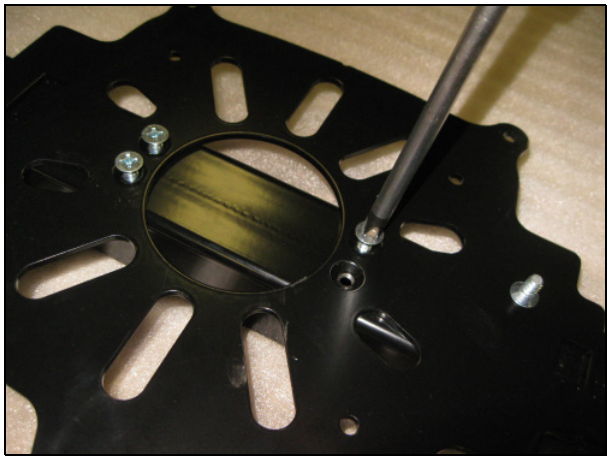
Step 1

Remove the spar from the box and lay out the hardware.



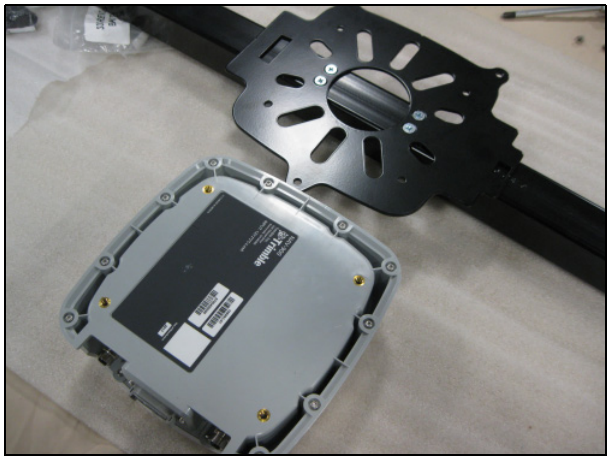
Step 2

Align the four holes on the base mounting plate with the four holes in the spar. Install the supplied ¼-20 × ½" countersunk bolts and tighten appropriately.



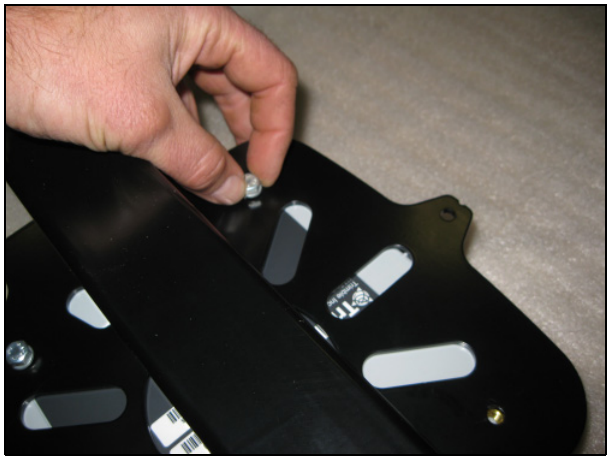
Step 3

Lay the guidance controller on its top.



Step 4

Lay the mounting plate with spar attached over on top. Attach the plate to the guidance controller with the four 6 mm bolts and lock washers. Tighten the bolts. Take care not to over-tighten the bolts as damage may result.







Step 5

Loosen and remove the large bolts on the cab that are to be used to fasten down the spar.



Step 6

Place the supplied spacer on the cab mounting point. The thickness of the spacer will vary by kit.



Step 7

Locate the provided longer bolts to be use for securing the spar. Put both the original washer and the larger provided washer on the bolt.



Step 8

Place the spar on the space and insert the bolt.



Step 9

Insert the bolt on the other side of the cab. Center the spar on the cab using a measuring tape. Then tighten the bolts.

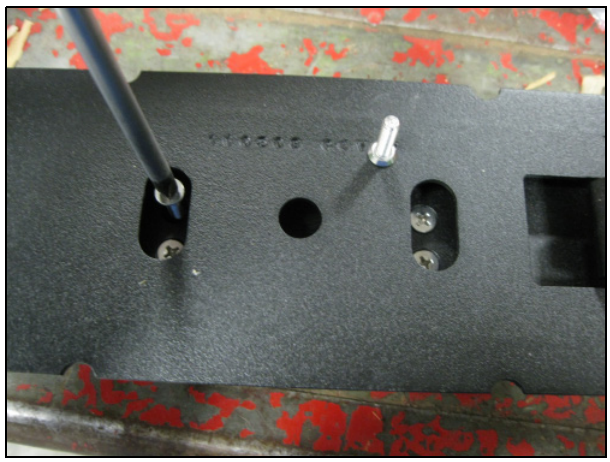




Optional: Using the P/N 110308 for quick release mounting of the NAV-900 from the spar

Step 1

Using the 4 bolts in the GFX/XCN display kit, mount the Quick release bracket to the spar.



Step 2

Attach the NAV-900 base plate to the NAV-900 controller.

Step 3

Slip the slot of the base plate over the tang on the bracket and then use the latch to secure the receiver.





NAV-900 guidance receiver: Connecting the cables— both methods

Step 1

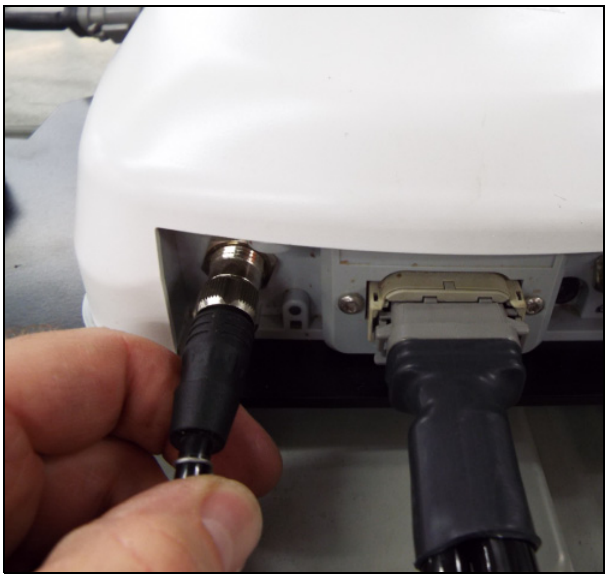
Plug the P1 connector on cable P/N 110550 into the back of the NAV-900 guidance receiver.





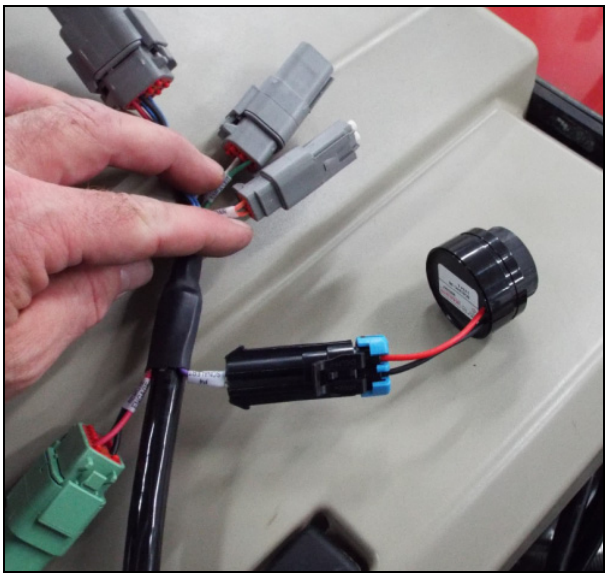
Step 2

Connect P2 of the P/N 110540 cable to the 4-pin M12 connector on the left side of the NAV-900 controller.

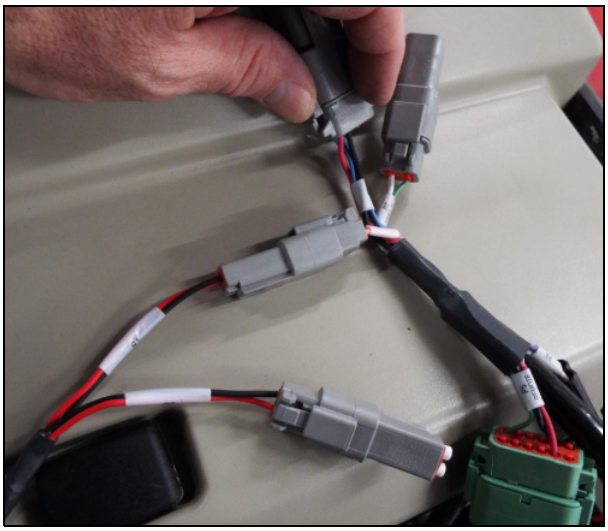


Step 3

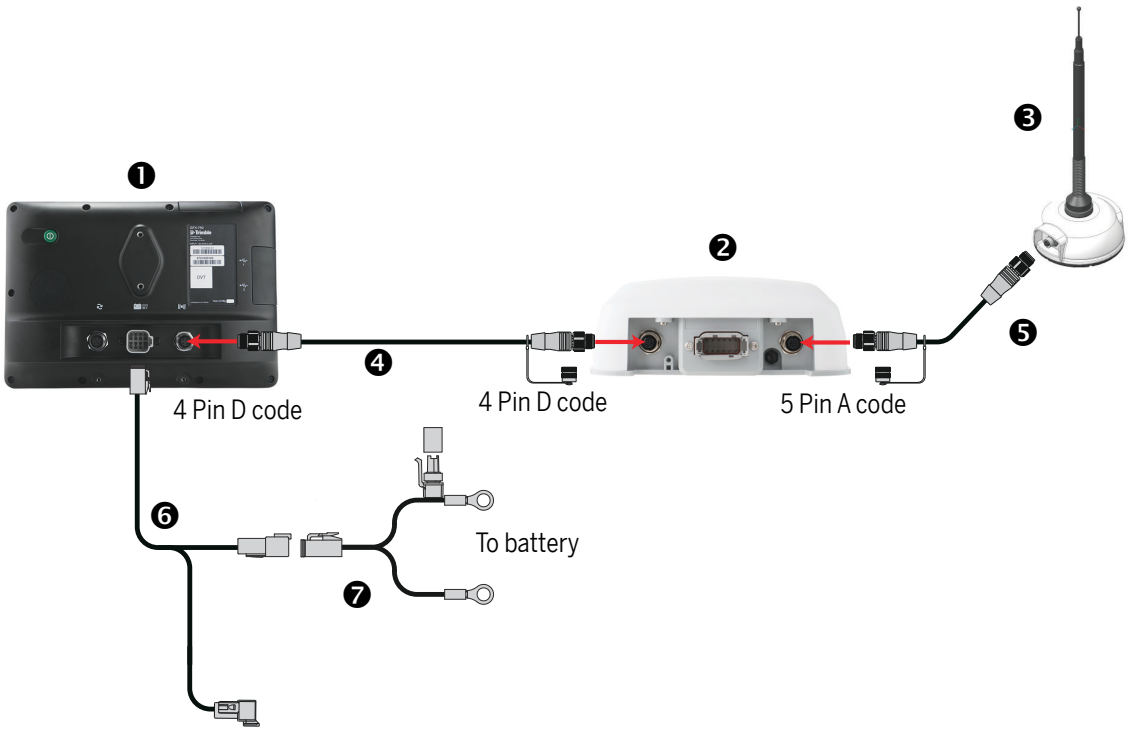
Connect the Sonalert to the cable P/N 110550.



Connect the NMEA output and modem power as needed.



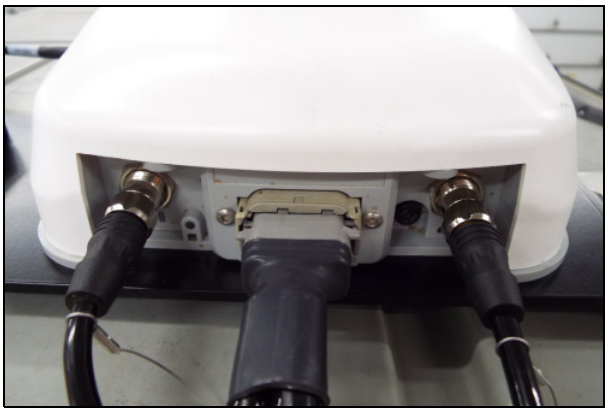
NAV-900 guidance receiver: Connecting an external radio (as required)



Item	Description	Trimble P/N
1	GFX/XCN display, with PIQ App	13x000-01
2	NAV-900 Guidance Controller	108993-05
3	Ag-820 radio kit, 430-450 MHz Ag-820 radio kit, 450-470 MHz Ag-820 radio kit, 900 MHz	123500-44 123500-46 123500-90
4	Cable Assy, GFX/XCN to NAV-500/900, Power/Ethernet (BRR), 5m	110540
5	Cable Assy, NAV-900 to Ag-820	113295
6	Cable Assy, GFX/XCN, Power to display, CAN, 2.5m	110551
7	Cable Assy, GFX/CFX/FM-750/XCN/FMX/FM-1000 Basic Power, 4m	67258

Step 1

Connect the radio interface cable (P/N 113295) to the right 5-pin M12 connector on the NAV-900 controller.



Step 2

Attach the radio to the roof or bracket in a secure fashion.

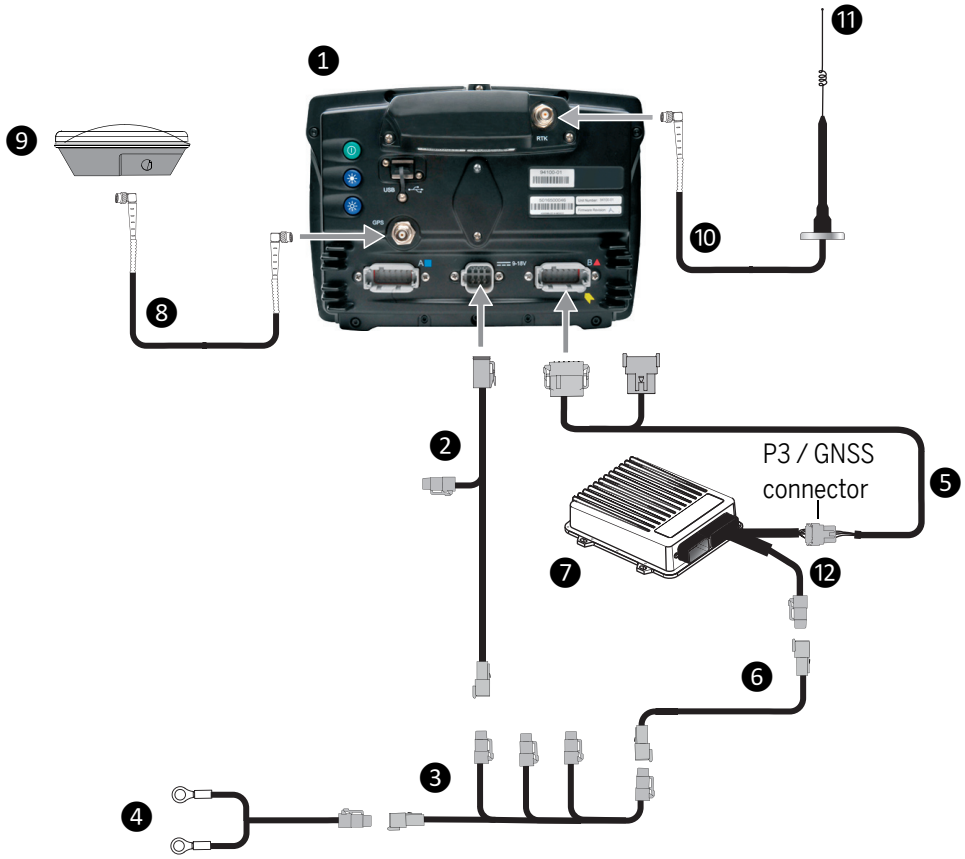


5

Display Installation

- CFX-750 display: Components
- CFX-750 display: Preparation
- CFX-750 display: Installation
- CFX-750 display: Installing the wiring harness
- TMX-2050 display: Components
- TMX-2050 display: Preparation
- TMX-2050 display: Installing the wiring harness
- TMX-2050 display: AG-25 GNSS antenna
- CFX-750 and TMX-2050 displays: Installing the GNSS antenna and plate
- CFX-750 and TMX-2050 displays: Installing the RTK radio antenna
- GFX/XCN display: Components
- GFX/XCN display: Preparation
- GFX/XCN display: Installation
- GFX/XCN display: Installing the wiring harness

CFX-750 display: Components



⚠ **CAUTION –** Connecting the Port Replicator on the CFX-750 to NavController cable ❺ to the P4 or P12 connector of the NavController harness ? will result in damage to the display, and will void the warranty.

Item	Description	Trimble part number
1	CFX-750 display **NOTE –** RTK password required.	93100-02
2	CFX-750 power cable	66694
3	CFX-750 power cable with relay and switch (power bus)	67259
4	Basic power cable	67258
5	CFX-750 to NavController II/III cable with port replicator	75741
6	2 pin DTM to 2 pin DT power adapter	67095
7	NavController III	55566-00
8	8 m GNSS TNC/TNC RT angle cable	50449
9	AG25 GNSS antenna	77038-00
10	NMO to TNC 20ft antenna cable and base	72122
11	900 MHz radio antenna kit	22882-10
12	Main NavController II/III cable	54601

CFX-750 display: Preparation

Step 1

Locate the CFX-750 display, the RAM mount, and the RAM mount clamp.



Step 2

Use the provided metric hardware to attach the RAM mount to the rear of the display.



Step 3

Attach the RAM mount to the rear of the display.



CFX-750 display: Installation

⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

Step 1

Decide where you will mount the display in the vehicle cab and then use the provided bolts to attach the bar mount to the rail.

Attach the free end of the RAM mount to the bar mount and then tighten the clamp on the RAM mount so that the display is secure.

Step 2

Connect the cable to the B port of the CFX-750 display.

To connect power to the CFX-750 display, see Chapter 8, Controller Installation.



CFX-750 display: Installing the wiring harness

Step 1

Locate the cable that connects the CFX-750 display to the NavController.

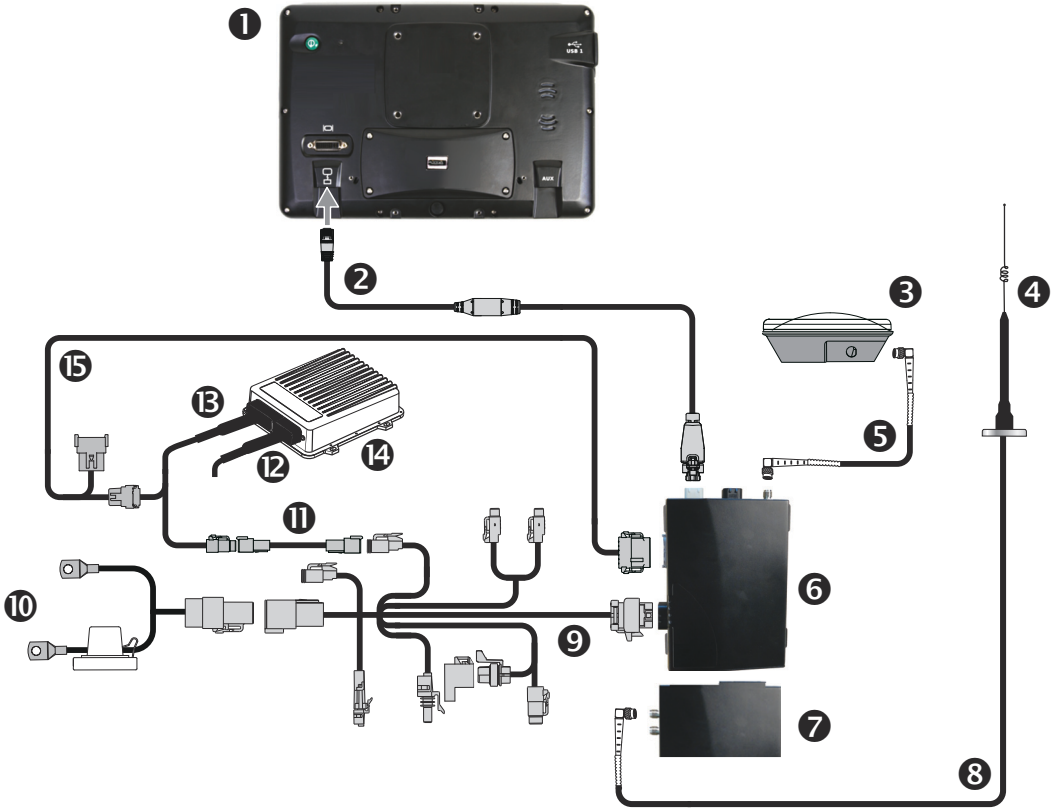
Step 2

Connect the cable to the P3 connector on the NavController main harness and then route the cable from the NavController to the mounting location on the CFX-750 display.



TMX-2050 display: Components

This graphic shows how to connect the TM-200 Module and the Autopilot system for after-market installations.



Item	Description	Trimble P/N
1	TMX-2050 display	96700-00
2	TM-200 Module to display cable	93843
3	AG-25 GNSS antenna	77038-00
4	900 MHz radio antenna kit	22882-10
5	8 m GNSS TNC/TNC RT angle cable	50449
6	TM-200 Module	95060-00
7	AG-815 radio	
8	NMO-to-TNC 20 ft antenna cable and base	72122
9	TM-200 Module power and I/O cable	92676
10	Cable, battery	92905
11	2-pin DTM to 2-pin DT power adapter cable	67095
12	Cable, NavController diagnostic	54602
13	Main NavController cable	54601
14	NavController III	55566-00
15	TM-200 Module to NavController cable with port replicator	75741

TMX-2050 display: Preparation

The display mount attaches to a rail in the cab of the vehicle. The TMX-2050 display connects to the display mount.

The TM-200 Module connects to the display with a single cable.

Additional components to install depend on your connection and correction services, and the features you are using.

⚠ **CAUTION –** Make sure the vehicle power is off when you are connecting system components.

Installing the display and mount

Use the mounting hardware supplied in the display kit to mount the display in the vehicle cab.

⚠ **CAUTION –** Make sure the vehicle power is off when you are connecting system components.

Before completing installation steps, select a position in the cab where the bar mount (4) can be attached to a rail. Hold the display in the selected location and make sure that it:

- Is easy to see, but does not block the driver's view.
- Is within the driver's reach so that the USB drive is easy to remove and replace.
- Does not interfere with the driver getting in or out of the cab, or any other activities.

.

Item	Description
1	Mounting plate
2	Zirkona mount
3	Tightening arm
4	Bar mount



Step 1

Locate the TMX-2050 display and the Zircona mount and mounting hardware.



Step 2

Use the provided hardware to attach the Zircona mount to the display as shown.





Step 3

Decide where you will mount the display in the vehicle cab and then use the provided bolts to attach the rail mount of the Zircona display mount to the rail of the vehicle.



Step 4

The Zircona mount has a tightening arm ❸. Loosen the arm to let the display move on the mount.

Step 5

Adjust the TMX-2050 display until it is positioned where you want it.

Turn the tightening arm clockwise to tighten the Zircona mount and lock the display in the desired position.

Step 6

Connect the display cable to the display.



Step 7

Route the other end of the display cable to the TM-200 Module and then connect it to the TM-200 Module.



TMX-2050 display: Installing the wiring harness

⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

Step 1

Connect the P5 and P2 connectors on the harness, P/N 106111, to the TM-200 Module.

Step 2

On the TM-200 Module locate the display connection point.



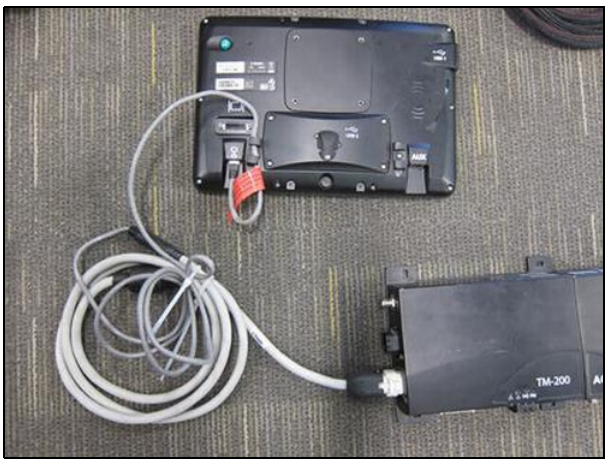
Step 3

Connect the display cable P/N 93843 to the TM-200 Module.



Step 4

Route the cable between the TMX-2050 display and the TM-200 Module.



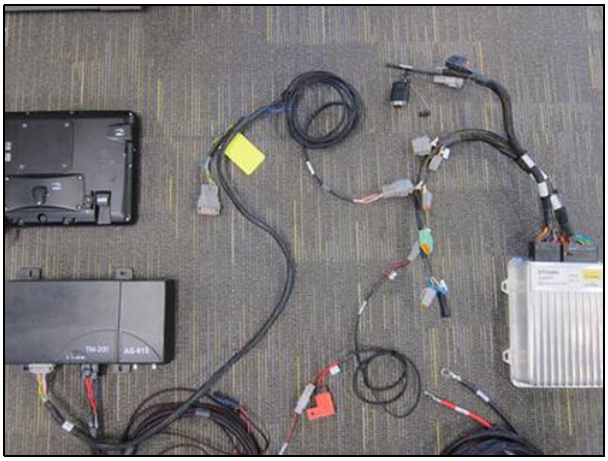
Step 5

Locate the Port labeled **A** on the TM-200 Module and then connect NavController connection cable, P/N 75741.



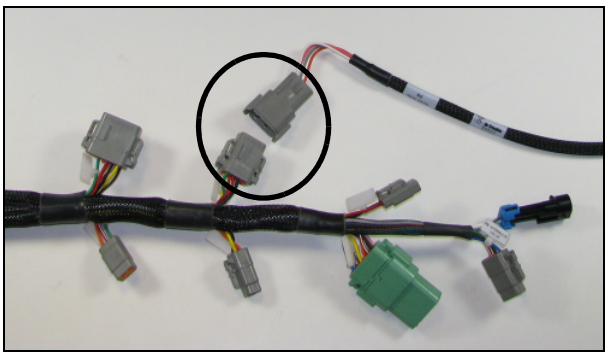
Step 6

Route the other end of the P/N 75741 cable to the plug on the P/N 54601 harness labeled **GPS**.



Step 7

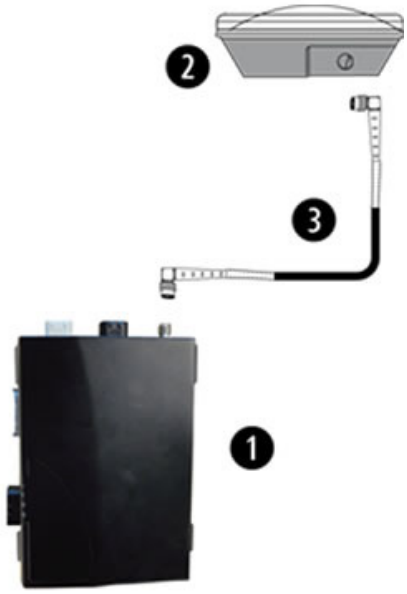
Connect the cable to the P3 connector on the NavController main harness.



TMX-2050 display: AG-25 GNSS antenna

The AG-25 GNSS antenna is required for all correction services. It enables the GNSS receiver in the TM-200 Module to receive GPS / GNSS corrections. The antenna connects to the antenna connector on the TM-200 Module

⚠ **CAUTION –** Wireless cellular radio and GNSS signals can interfere with each other. For best performance, mount antennas at least 1 meter away from each other.



Item	Description
1	TM-200 Module
2	AG-25 GNSS antenna
3	AG-25 antenna to TM-200 Module cable

The AG-25 GNSS antenna has integrated magnets for easy installation. To attach the antenna to a non-metal surface, use the mounting plate.

NOTE – If you are using the AG-25 GNSS antenna with a steering system, refer to the installation instructions for the steering system to determine the correct location for mounting the antenna.

CFX-750 and TMX-2050 displays: Installing the GNSS antenna and plate

⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

NOTE – The V plate antenna bracket is available on the Autopilot price list. See Antenna mounting kits, page 11.

Use one of the following methods:

- Spar mount
- VHB adhesive

Spar mount method

Trimble recommends that you use this method for RTK and OmniSTAR operations. For more information, see Antenna and receiver installation options, page 79.

Use a ⅝" bolt to attach the AG25 antenna to the spar, as shown.

Measure the length between the bolts on the roof of the vehicle and order the appropriate spar:

- Spar 36.5" - 46.5": P/N 53676
- Spar 54" - 64": P/N 66774



VHB adhesive method

Standard 4" x 6" plates are provided in most kits. You can use Very High Bond (VHB) to attach either a 4" x 6" plate or a V plate.

- **GLONASS, RTK, OmniSTAR, DGPS applications** – To use this method for high accuracy, the surface must be rigid and free of “oil panning”. For RTK or OmniSTAR HP corrections, the spar method is recommended. The V plate provides repeatable positioning of the antenna.
- **WAAS, EGNOS, OmniSTAR VBS, Beacon applications** – Use a 4" x 6" plate for simplified installation in applications where high accuracy is not critical.

Step 1

Clean the antenna location on the roof of the cab with a light solvent to remove oil and dust.

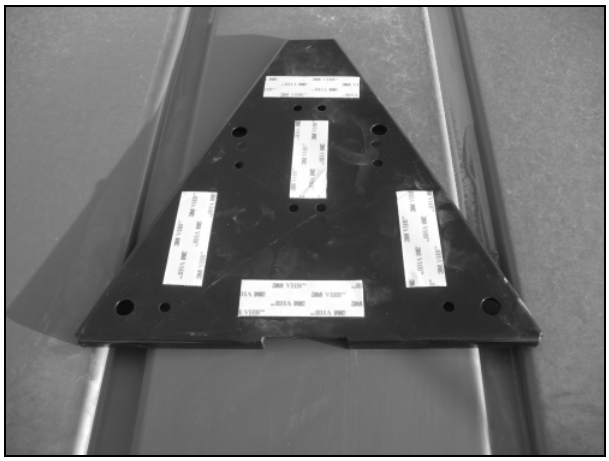


Step 2

V plate only

Remove the backing from one side of the VHB strips provided and then apply the strips to the plate.

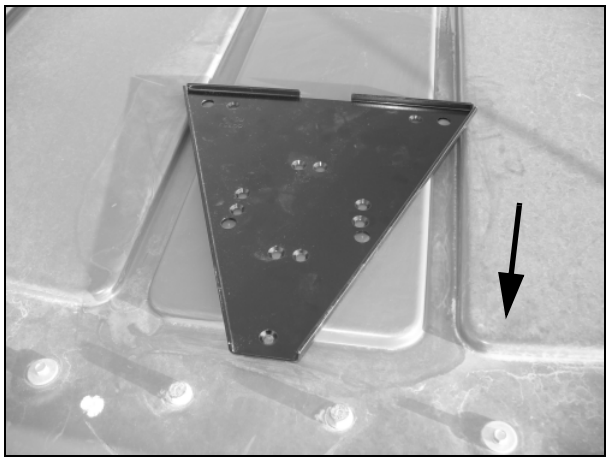
NOTE – The VHB strips are pre-applied to the 4" x 6" plate.



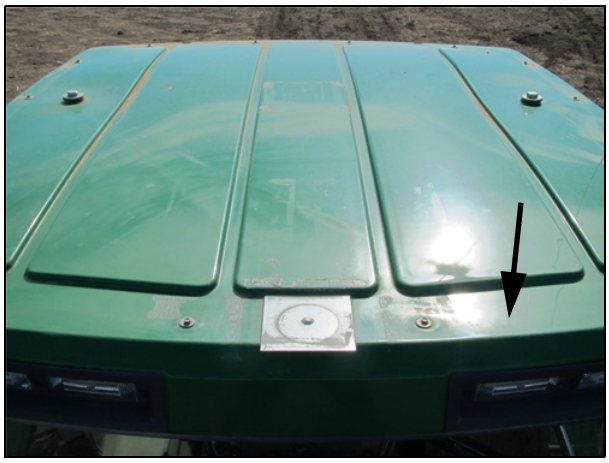
Step 3

Remove the backing from the other side of the VHB strips and then apply the plate to the cab roof. The narrow end points forward. Ensure that the VHB strips make even contact with the surface. Apply pressure and then leave for approximately 30 minutes to adhere.

NOTE – The arrow in this figure points to the front of the vehicle.



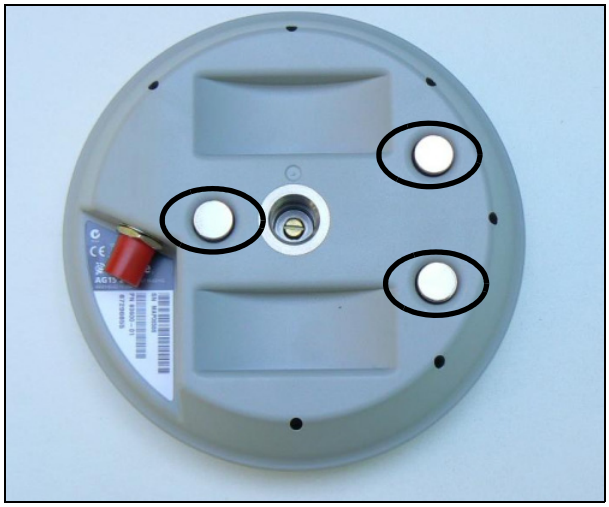
V plate



4" x 6" plate

Step 4

If the antenna has magnets built in, omit this step.



Otherwise, attach the large magnet with a ⅝" stud to the GNSS antenna.



Step 5

GLONASS, RTK, OmniSTAR, DGPS, applications

For repeatable positioning, place the antenna against the lip at the narrow end of the V plate.



WAAS, EGNOS, VBS, Beacon applications

Attach the antenna to the center of the 4" x 6" plate.



Step 6

Both models

Attach the antenna/receiver cable to the antenna and then route the cable into the cab through the rubber grommet at the base of the rear window. Secure the cable along the way.



CFX-750 and TMX-2050 displays: Installing the RTK radio antenna

⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

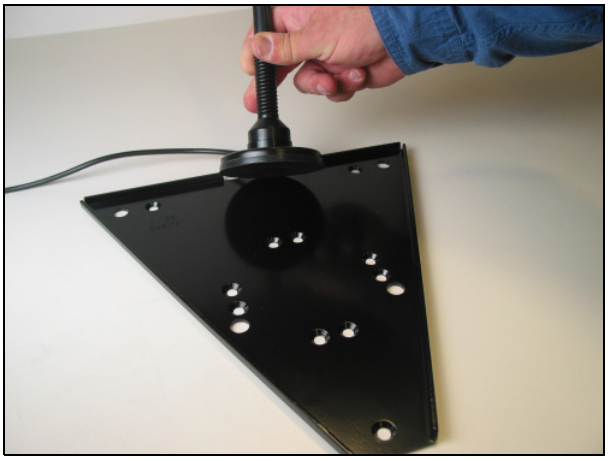
Step 1

Connect the radio antenna to the magnetic antenna base.



Step 2

Attach the magnetic radio antenna base to the rear of the V plate on the roof. If the cable does not reach the V plate, use the 4" x 6" plate with the VHB provided to relocate the antenna.



Step 3

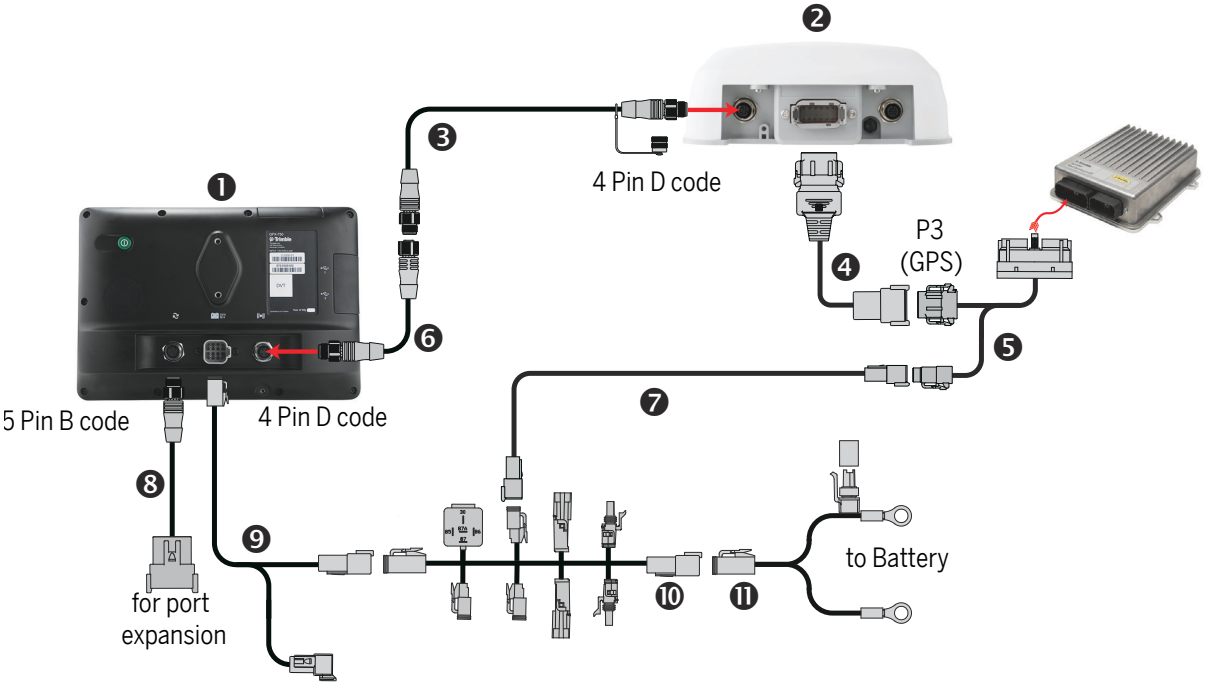
Attach the magnetic radio antenna base to the rear of the V plate on the roof. If the cable does not reach the V plate, use the P/N 62034 plate with the VHB provided to relocate the antenna.

Step 4

Route cable from the vehicle roof into the cab, and connect the radio cable to the display.



GFX/XCN display: Components



Item	Description	Trimble P/N
1	GFX/XCN display, with PIQ App	13x000-01
2	NAV-900 Guidance controller	108993-05
3	Cable Assy, GFX/XCN to NAV-500/900, Power/Ethernet (BRR), 5m	110540
4	Cable Assy, NAV-900 to Nav III, Autopilot	110547
5	Cable, NavController II/III, Main	54601
6	Cable Assy, GFX/XCN to NAV-500/900, Power/Ethernet (BRR) Extension, 2.5m Optional extension for large vehicles	112082
7	Cable Assy, 2 PIN DTM to 2 PIN DT Power Adapter	67095
8	Cable Assy, GFX/XCN, Expansion Port Basic, RS232, Dig I/O, 2.5m	110545
9	Cable Assy, GFX/XCN, Power to display, CAN, 2.5m	110551
10	Cable Assy, GFX/CFX/FM-750™/XCN/FmX®/FM-1000™ Power with Relay and Switch (Acc)	67259
11	Cable Assy, GFX/CFX/FM-750/XCN/FMX/FM-1000 Basic Power, 4m	67258

GFX/XCN display: Preparation

The GFX/XCN display utilizes the RAM mount system.



Attach the diamond-based ram mount to the back of the display using the provided fasteners.



GFX/XCN display: Installation

Step 1

Use the supplied V bolts or alternate (non-supplied) hardware to affix the RAM base mount to the desired location in the cab. Ideally this position should be readily viewable and within easy reach of the operator.



Step 2

Use the supplied RAM clamp to connect the RAM base mount to the RAM ball attached to the display.



Step 3

Position the display as desired and then tighten the clamp.



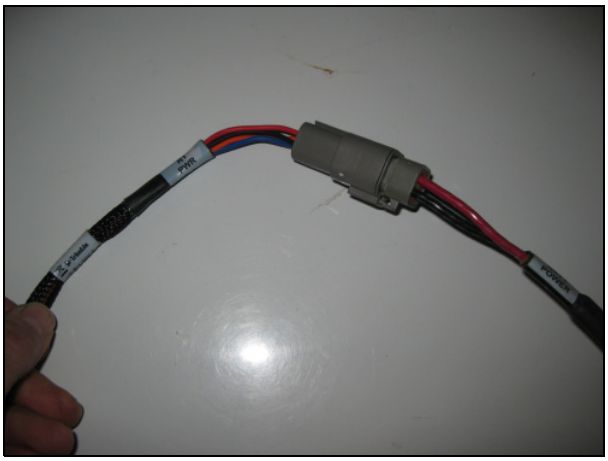
GFX/XCN display: Installing the wiring harness

The GFX/XCN display requires a nominal 12 volt power source. The P/N 67258 cable has ring terminal leads for connecting to a battery or other cable mount point.

⚠ **WARNING –** If the machine has a master electrical disconnect, ensure that the display/receiver will be disconnected from the battery when the master disconnect is used. Failure to do so may result in hardware damage and void warranty. Additionally, it is suggested to utilize power terminals located within the cab of the vehicle that ground in the same location as the cab components to avoid ground shifts between the display and any vehicle ECUs.

Step 1

Connect the other 4-pin Deutsch connector of cable P/N 110551 to the P/N 67258 base power cable.



Step 2

Connect the 6-pin DT power/CAN cable P/N 110551 to the middle port of the display.



Step 3

Connect the 4-pin M12 connector to the 4-pin receiver connector. Note the Keying and number of pins.



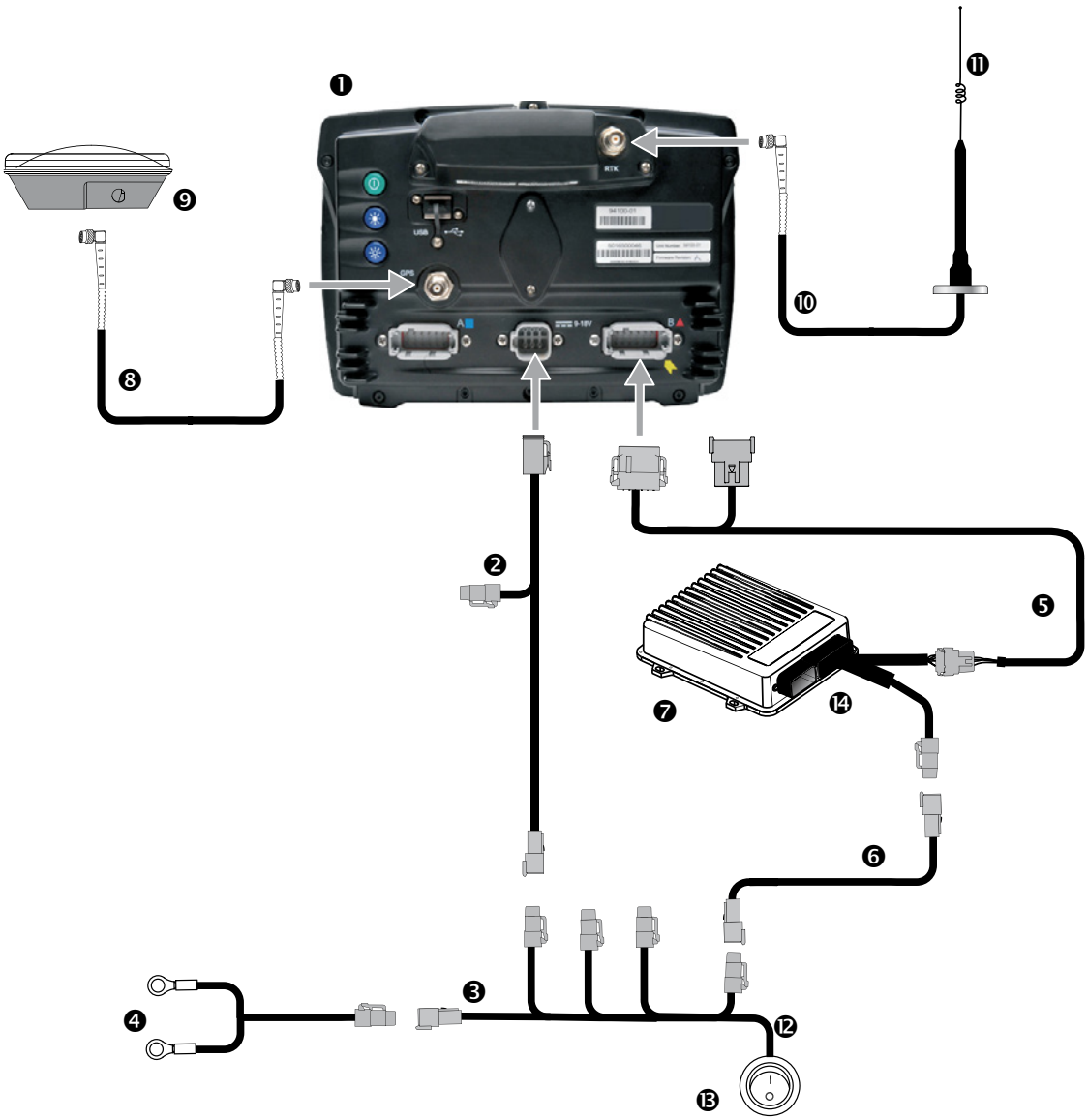


6

Power Harness Installation

- CFX-750 display: Components
- GFX/XCN display: Components
- CFX-750 and GFX/XCN displays: Installing the power harness
- CFX-750 and GFX/XCN displays: Configuring the power bus options
- TMX-2050 display: Components
- TMX-2050 display: Installing the power harness
- TMX-2050 display: Configuring the power options

CFX-750 display: Components

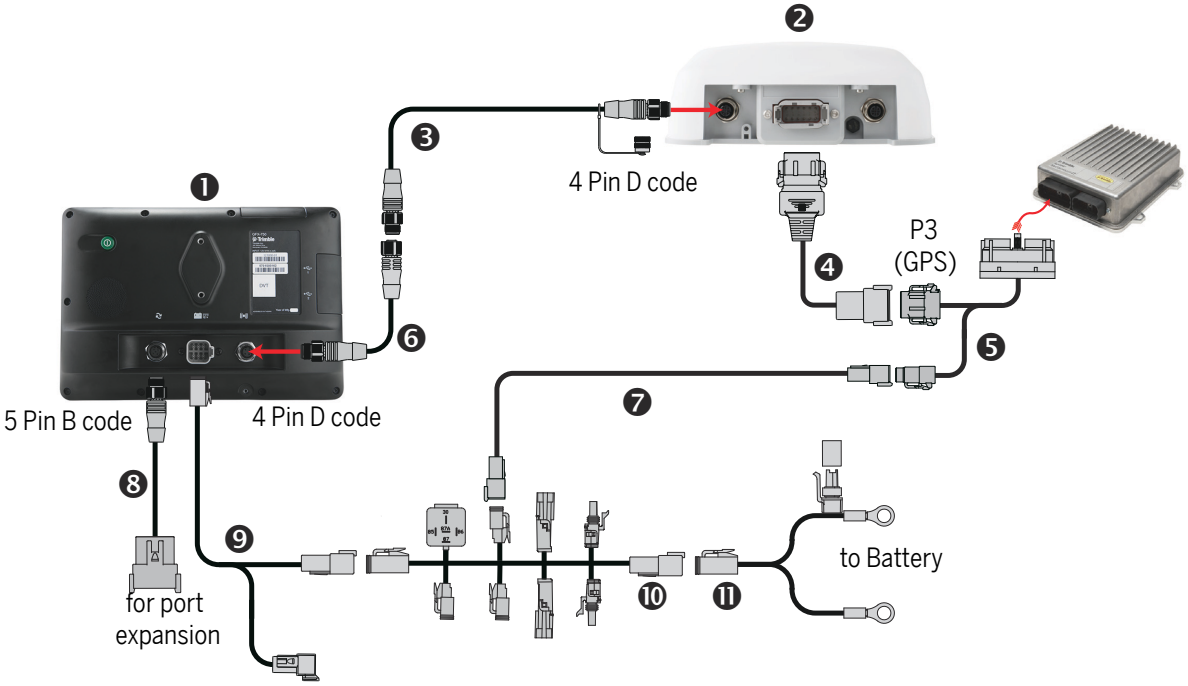


⚠ **CAUTION –** Connecting the Port Replicator on the CFX-750 display to NavController cable ❺ to the P4 or P12 connector of the NavController harness ⓮ will result in damage to the CFX-750 display and will void the warranty.

Item	Description	Trimble P/N
1	CFX-750 display **NOTE –** RTK password required.	94100-02
2	CFX-750 power cable	77282
3	CFX-750 power cable with relay and switch (power bus)	67259
4	Basic power cable	67258

Item	Description	Trimble P/N
5	CFX-750 to NavController cable with port replicator	75741
6	2 pin DTM to 2 pin DT power adapter	67095
7	NavController III	55566-00
8	8 m GPS TNC/TNC RT angle cable	50449
9	AG25 GNSS antenna	77038-00
10	NMO to TNC 20ft antenna cable and base	62120
11	900 MHz radio antenna kit	22882-10
12	External switch cable included with kit	Part of P/N 67259
13	External switch included with kit	Part of P/N 67259
14	Main NavController cable	54601

GFX/XCN display: Components



Item	Description	Trimble P/N
1	GFX/XCN display, with PIQ App	13x000-01
2	NAV-900 Guidance controller	108993-05
3	Cable Assy, GFX/XCN to NAV-500/900, Power/Ethernet (BRR), 5m	110540
4	Cable Assy, NAV-900 to Nav III, Autopilot	110547
5	Cable, NavController II/III, Main	54601
6	Cable Assy, GFX/XCN to NAV-500/900, Power/Ethernet (BRR) Extension, 2.5m Optional extension for large vehicles	112082
7	Cable Assy, 2 PIN DTM to 2 PIN DT Power Adapter	67095
8	Cable Assy, GFX/XCN, Expansion Port Basic, RS232, Dig I/O, 2.5m	110545
9	Cable Assy, GFX/XCN, Power to display, CAN, 2.5m	110551
10	Cable Assy, GFX/CFX/FM-750/XCN/FmX/FM-1000 Power with Relay and Switch (Acc)	67259
11	Cable Assy, GFX/CFX/FM-750/XCN/FMX/FM-1000 Basic Power, 4m	67258

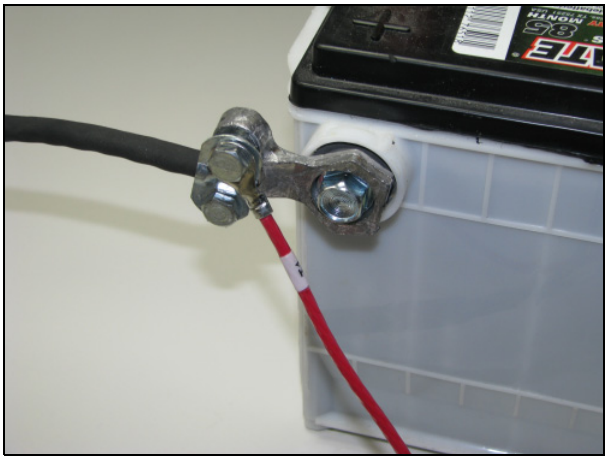
CFX-750 and GFX/XCN displays: Installing the power harness

NOTE – Unless otherwise stated, instructions for "the display" refer to the CFX-750 display.

⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

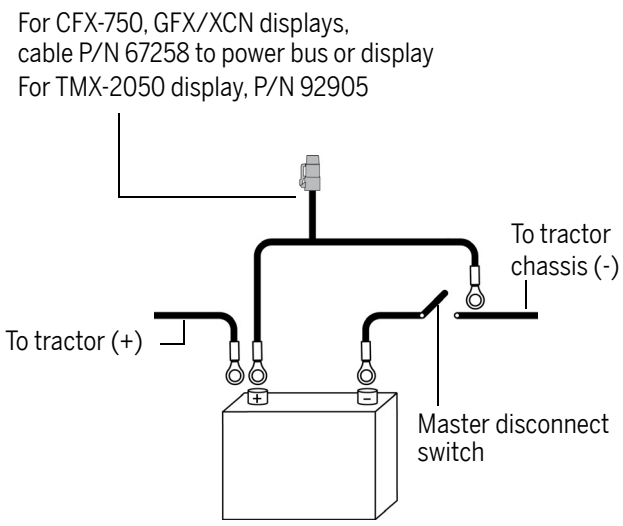
Step 1

Connect the basic power cable to the vehicle battery and then route the cable into the cab.



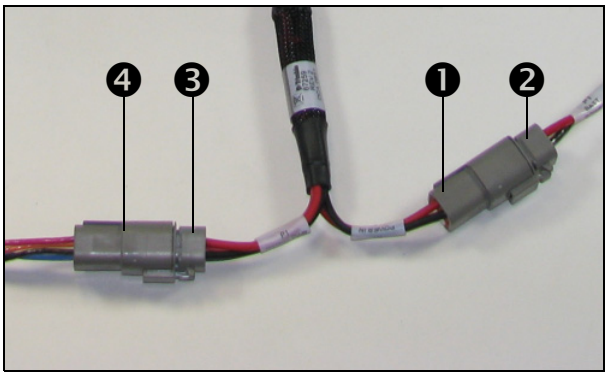
⚠ **CAUTION –** If the vehicle has a master electrical disconnect, make sure the basic power cable (P/N 67258 / 92905) is not directly attached to the battery terminal that is disconnected by the master switch—the negative pole in this example.

Attach this terminal side just past the main disconnect so that it is as close as possible to the battery but still gets disconnected when the master disconnect is turned off. Failure to do so can result in damaging the display.



Step 2

Locate and connect the 4-pin Deutsch DTP receptacle on the power bus ❶ to the 4-pin Deutsch DTP plug ❷ on the basic power cable and then remove the protective cap from the 4-pin Deutsch DTP plug ❸ on the power bus and connect the plug to the 4-pin Deutsch DTP receptacle ❹ on the display power adapter.



Step 3

Route the display power adapter to the display mounting location and then connect it to the display.



CFX-750 display

CFX-750 and GFX/XCN displays: Configuring the power bus options

NOTE – Unless otherwise stated, instructions for "the display" refer to either the GFX/XCN or the CFX-750 display.

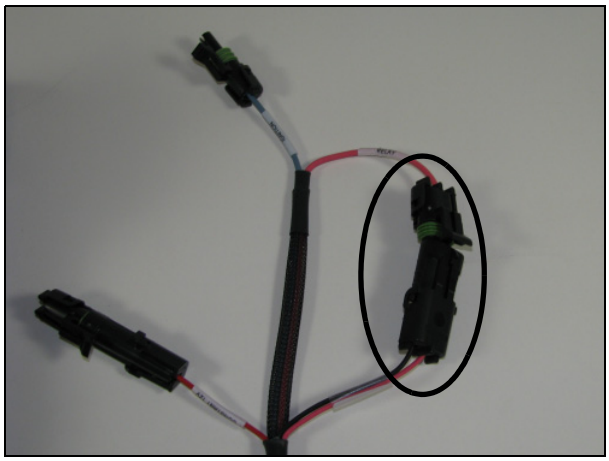
⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

When you use the power bus cable, use one of the following configuration methods to turn on the Autopilot system:

- Display power button is used to turn on the Autopilot system
- External switch is used to turn on the Autopilot system
- Ignition is used to turn on the Autopilot system

Display power button is used to turn on the Autopilot system

Connect the 2 pin connectors labeled **R2** and **P2** on the power bus.

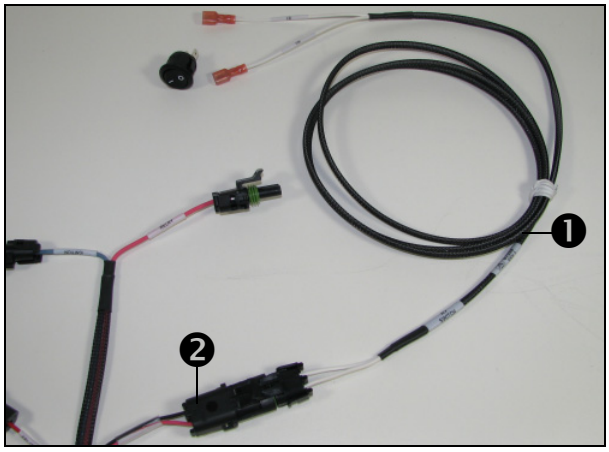


External switch is used to turn on the Autopilot system

Step 1

Connect the cable labeled **R7** switch ❶ (included with the power bus) to connector labeled **P2** on the power bus ❷ and then route the cable labeled **R7** to a switch location.

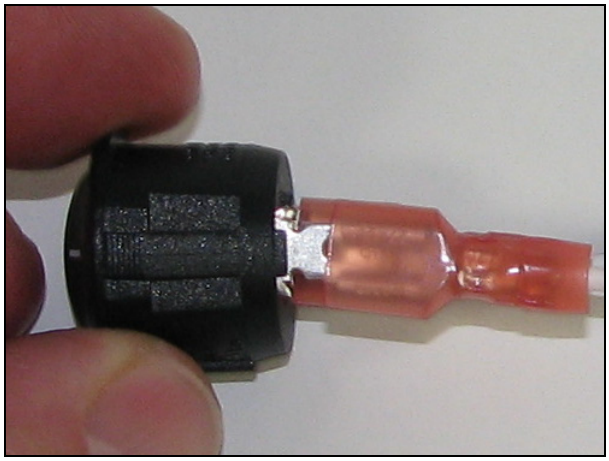
NOTE – To install the switch provided, drill a ¾" hole.



Step 2

Connect the cable labeled **R7** to the switch pins.

NOTE – Polarity is not important.

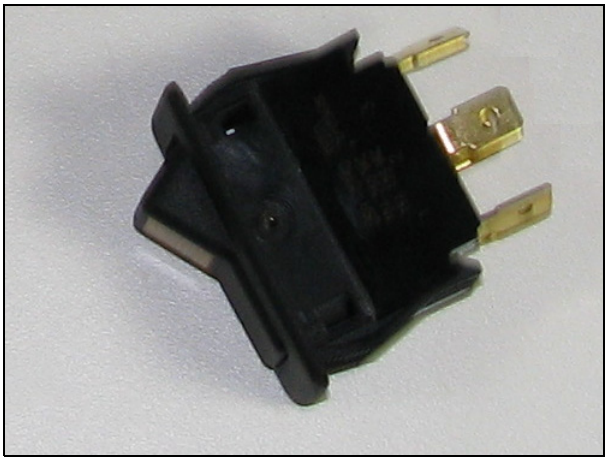


Installing the optional illuminated full or standard Euro switch

Step 1

Find an available knockout location on the vehicle console.

NOTE – An alternative location is required for the switch provided.

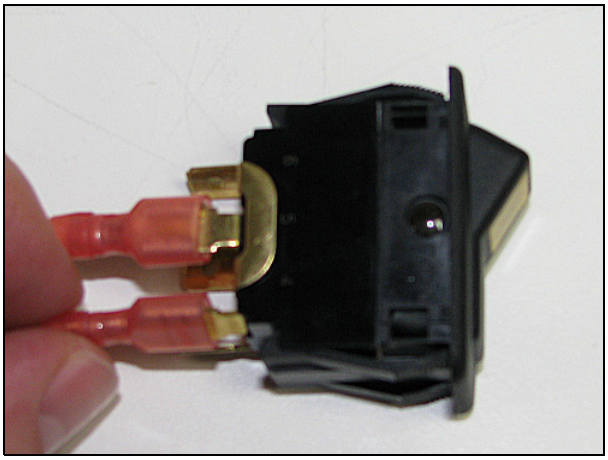


Step 2

Route the cable labeled **R7** to the switch location and then connect the cable to the illuminated switch.

Connect the wire labeled **S1** to pin 5 on the switch and then connect the wire labeled **S2** to pin 4 on the switch.

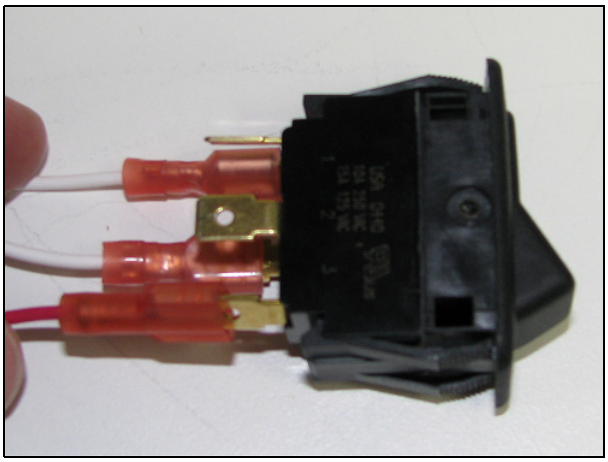
NOTE – Polarity is important.



Step 3

Connect a separate wire to pin 3 on the switch using a spade connector. Route the wire and then connect it to the vehicle switched power.

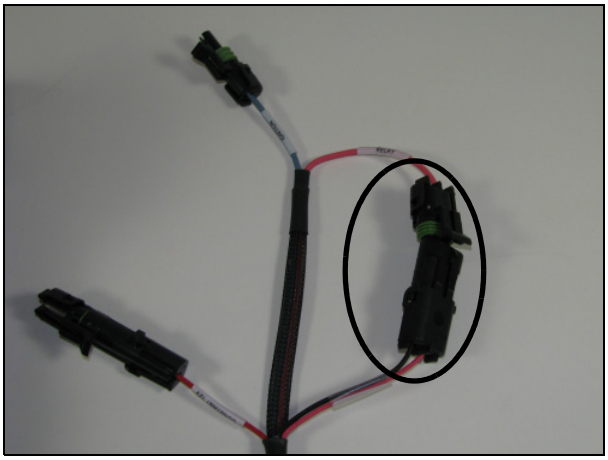
NOTE – This additional wire is required to allow the switch to illuminate.



Ignition is used to turn on the Autopilot system

Step 1

Connect the 2-pin connectors labeled **R2** and **P2** on the power bus.

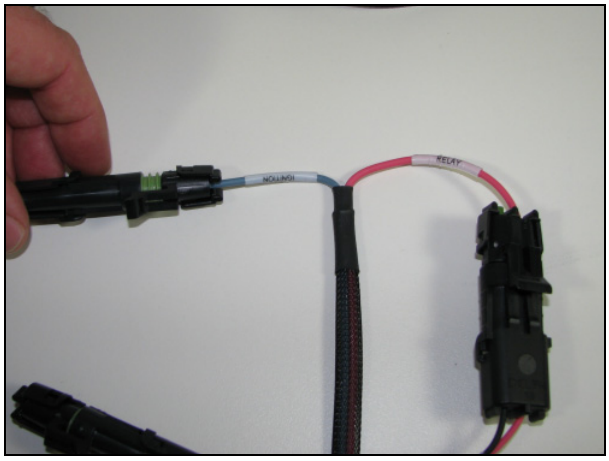


Step 2

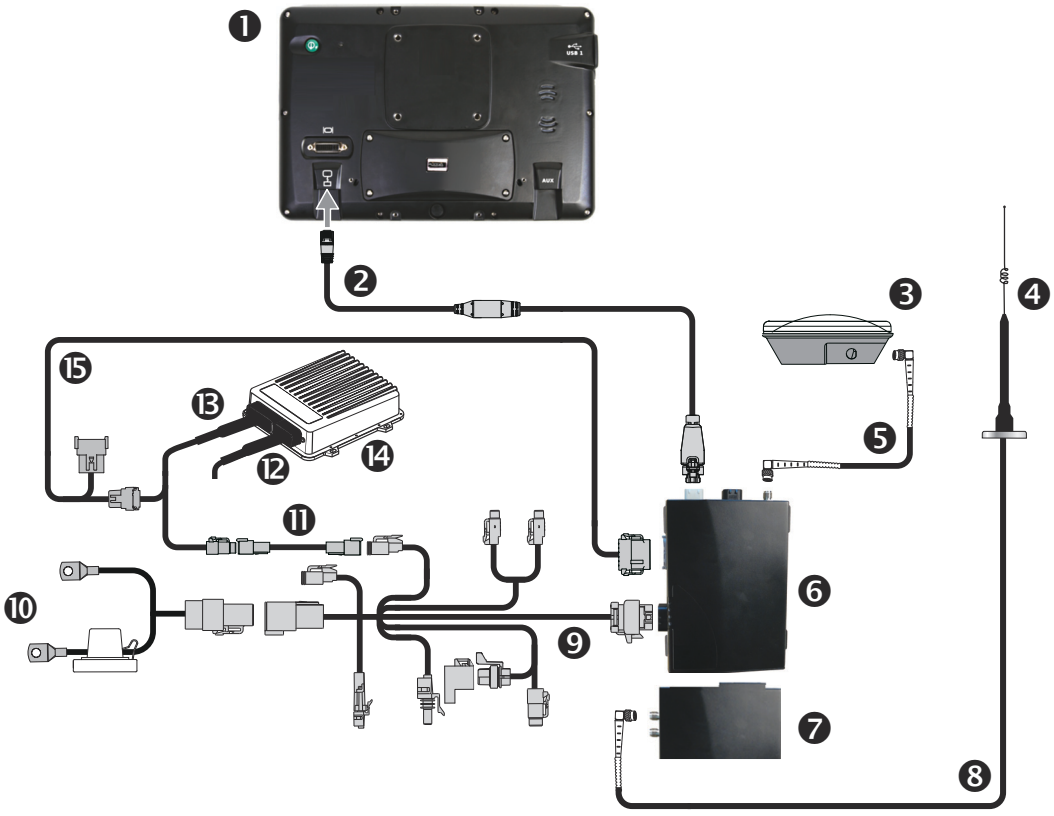
Connect the cable labeled **R8 Ignition** (included with the power bus) to connector **P3 Ignition** on the power bus.

Step 3

Route the cable to the vehicles ignition.



TMX-2050 display: Components



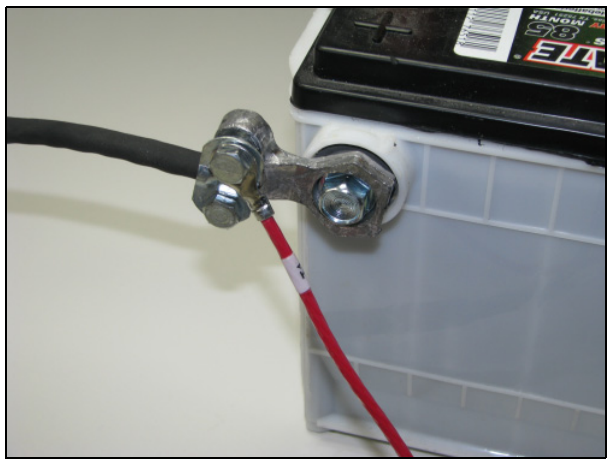
Item	Description	Trimble P/N
1	TMX-2050 display	96700-00
2	TM-200 Module to display cable	93843
3	AG-25 GNSS antenna	77038-00
4	900 MHz radio antenna kit	22882-10
5	8 m GNSS TNC/TNC RT angle cable	50449
6	TM-200 Module	95060-00
7	AG-815 radio	
8	NMO-to-TNC 20 ft antenna cable and base	72122
9	TM-200 Module power and I/O cable	92676
10	Cable, battery	92905
11	2-pin DTM to 2-pin DT power adapter cable	67095
12	Cable, NavController diagnostic	54602
13	Main NavController cable	54601
14	NavController III	55566-00
15	TM-200 Module to NavController cable with port replicator	75741

TMX-2050 display: Installing the power harness

⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

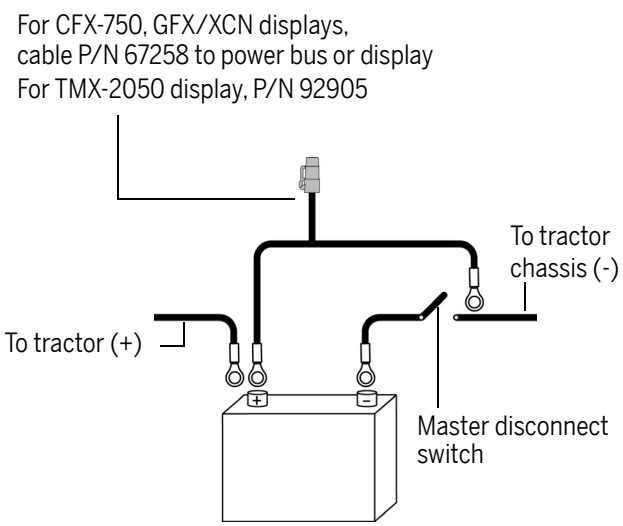
Step 1

Connect the basic power cable to the vehicle battery and then route the cable into the cab.



⚠ **CAUTION –** If the vehicle has a master electrical disconnect, make sure the basic power cable (P/N 67258 / 92905) is not directly attached to the battery terminal that is disconnected by the master switch—the negative pole in this example.

Attach this terminal side just past the main disconnect so that it is as close as possible to the battery but still gets disconnected when the master disconnect is turned off. Failure to do so can result in damaging the display.



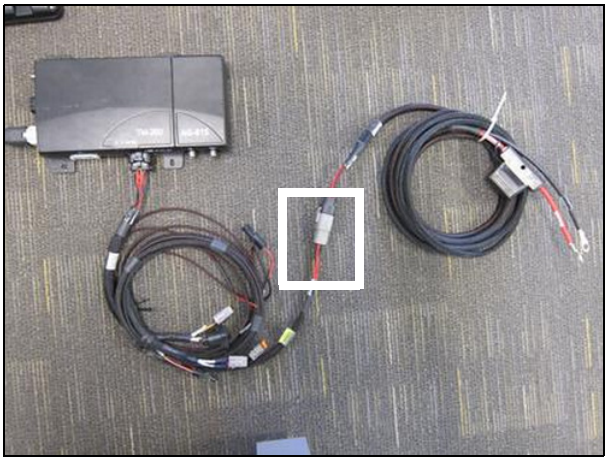
Step 2

Connect the power I/O cable P/N 92676 to the power port on the TM-200 Module.



Step 3

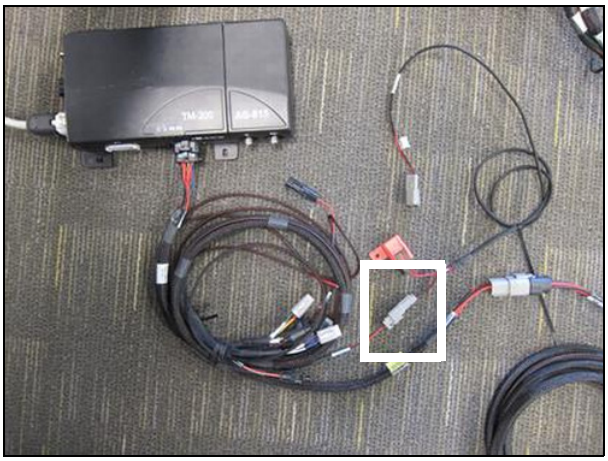
Route the power cable P/N 92905 that you previously connected to the battery and connect it to the R3 power in plug on the P/N 92676 cable.



Step 4

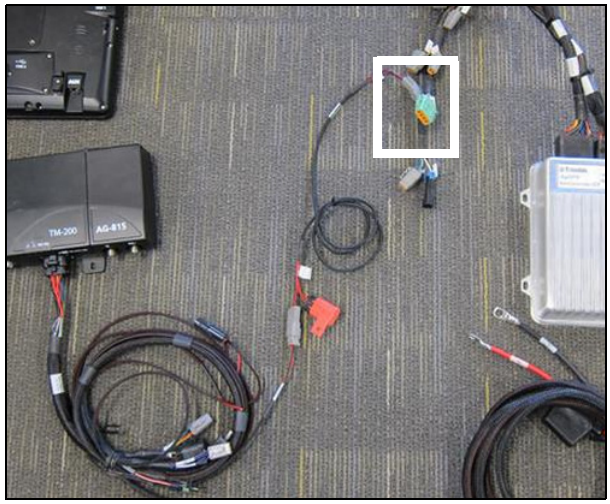
Connect the 2-pin DTM to 2-pin DT power adapter P/N 67095 to the P2 power out connector on the P/N 92676 cable.

Route the other end to the NavController harness P/N 54601.



Step 5

Connect the other end of the P/N 67095 cable to the P2 power plug on the P/N 54601 cable.



TMX-2050 display: Configuring the power options

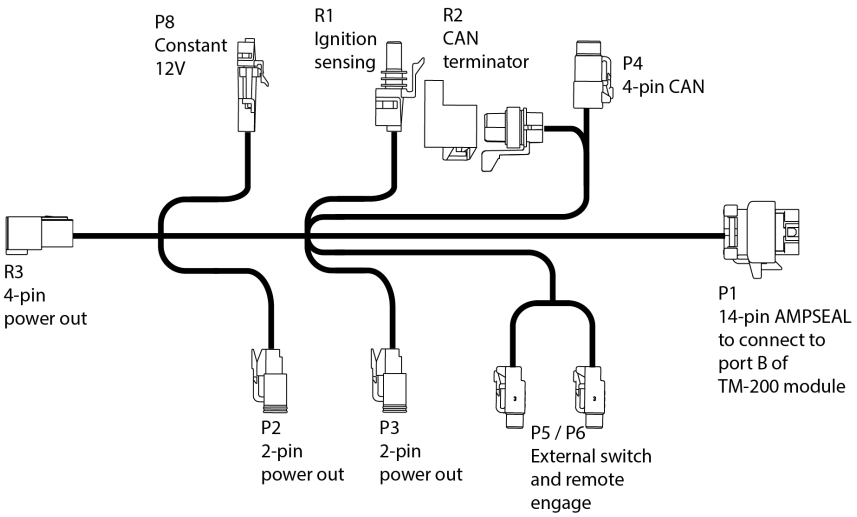
⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information.

When you use the power bus cable, use one of the following methods to turn on the Autopilot system on the Trimble TMX-2050 displays:

- The display power button. No further changes need to be made to the power cables.
- Ignition sensing. See below.

Ignition sensing

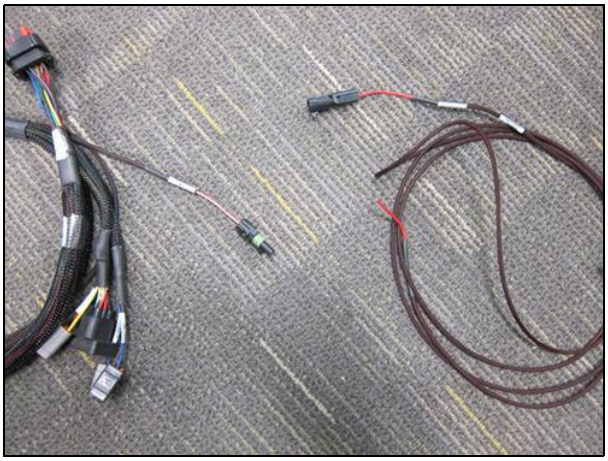
For ignition sensing with the TMX-2050 display, connect the ignition on the power supply to the R1 connector on the harness, P/N 92676.



For more information on how to use the ignition sensing option, refer to the *TMX-2050 Display User Guide*.

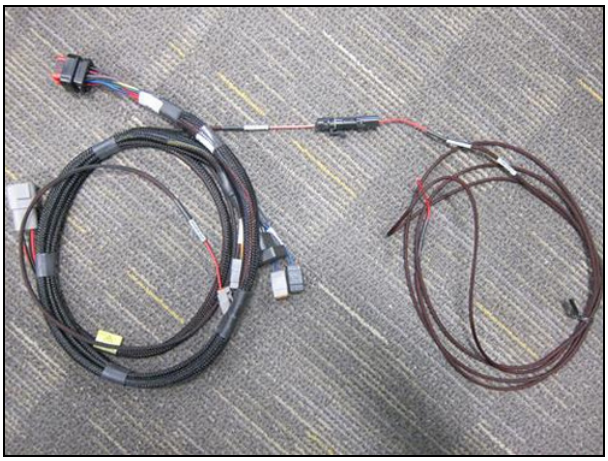
Step 1

Locate the R1 ignition sensing plug on the P/N 92676 cable; also locate the ignition sensing wire provided with the P/N 92676 cable.



Step 2

Connect the red ignition sense wire to the vehicle ignition source then route to the plug on the harness and then connect it.



7

Remote Engage Switch Installation

- Remote engage switch components: Rocker switch
- Remote engage switch components: Foot switch
- Preparing the remote engage cable
- Using the remote engage switch

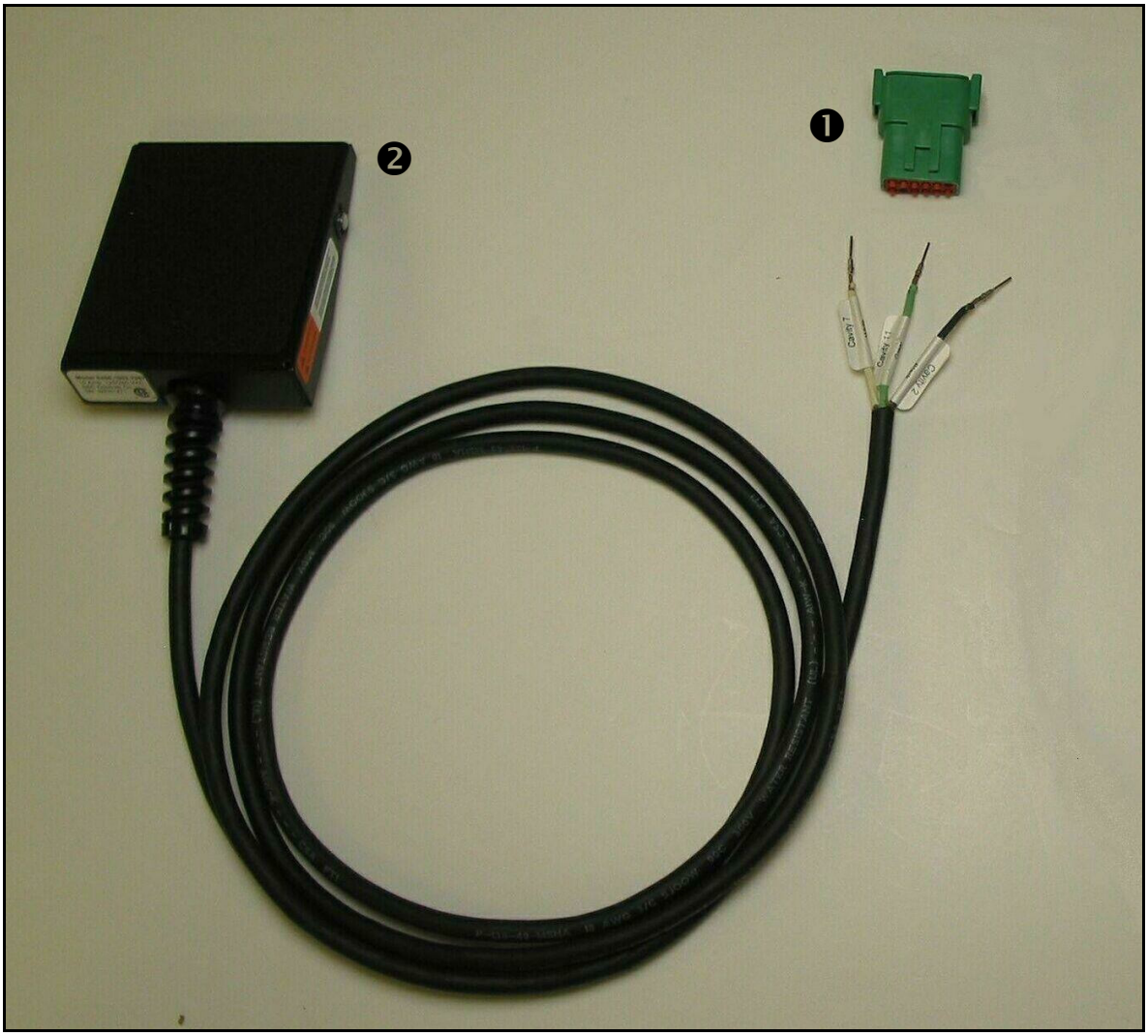
Remote engage switch components: Rocker switch



Item	Description
1	DTM receptacle
2	Remote engage rocker switch

NOTE – This is a Full or Standard Euro switch, depending on the kit ordered.

Remote engage switch components: Foot switch

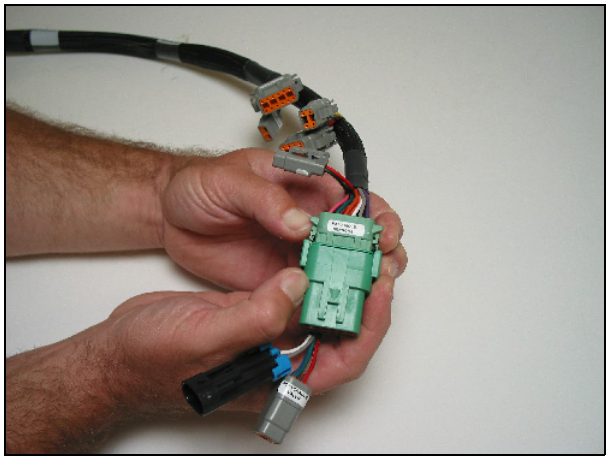


Item	Description
1	DTM receptacle
2	Remote engage foot switch

Preparing the remote engage cable

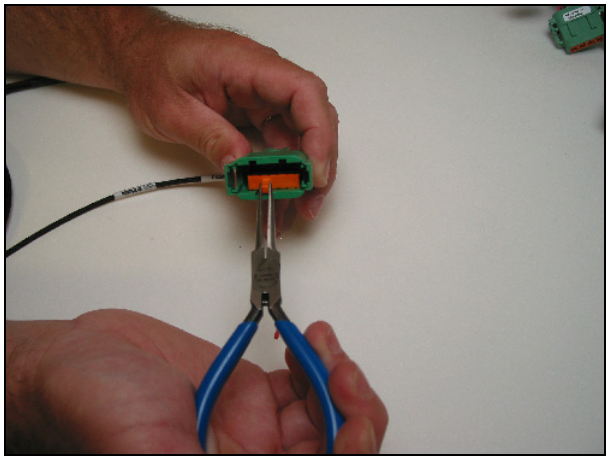
Step 1

Locate the green 12-pin Deutsch receptacle on the P-5 leg of the main controller harness. For more information, see Controller connections, page 148.



Step 2

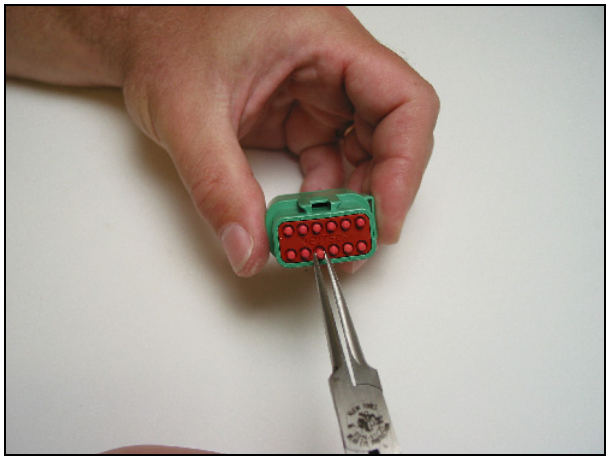
Remove the wedge from the connector.



Step 3

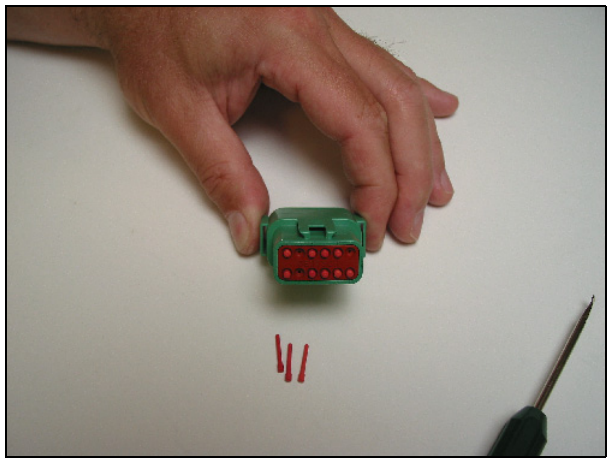
Rocker switch only

Remove the plugs from cavity 2 and cavity 7.



Foot Switch Only

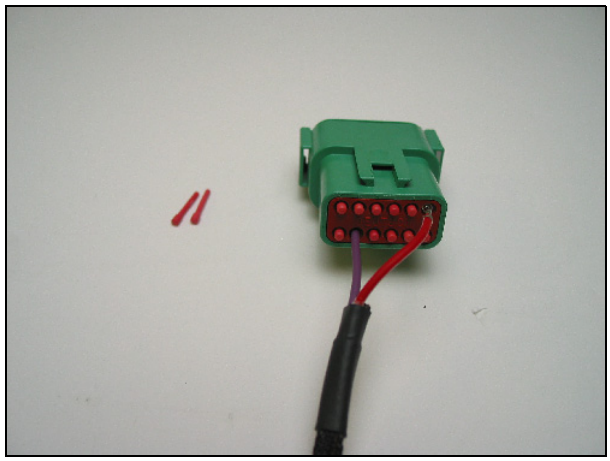
Remove the plugs from cavity 2, cavity 7, and cavity 11.



Step 4

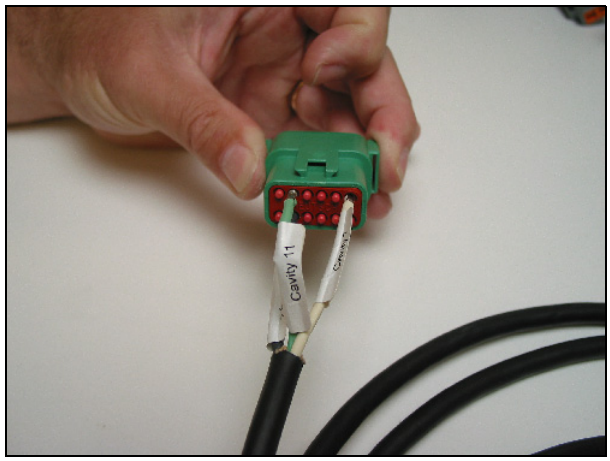
Rocker switch only

Insert the DTM pins into cavity 2 and cavity 7, according to the labels on the wires.



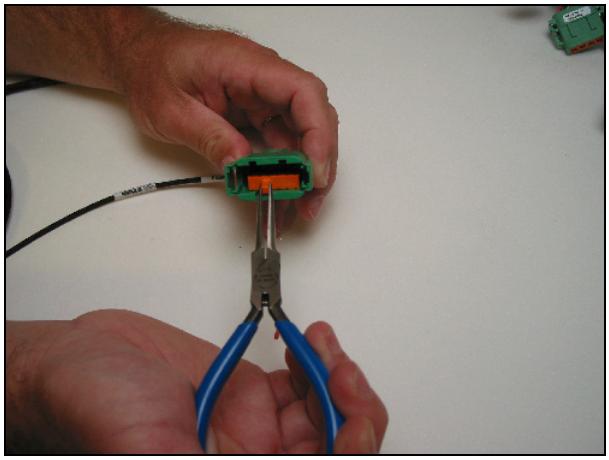
Foot switch only

Insert the DTM pins into cavity 2, cavity 7, and cavity 11, according to the labels on the wires.



Step 5

Pull on the wires to seat them in place and then replace the wedge in the connector.



Step 6

Replace the receptacle on the P5 plug of the NavController III harness.

Step 7

Rocker switch only

Run the spade ends of the cable to a knockout location in the operator console.



Foot switch only

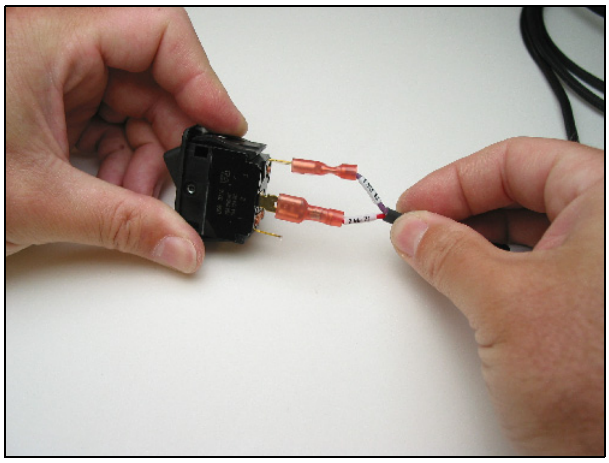
Run the cable to a clear location on the floor board. Use double-sided tape to secure the pedal. Route the cable under the floor mat.



Step 8

Rocker Switch Only

Connect the wires to the switch. Match the print on the switch body with the labels on the wires.



Step 9

Rocker Switch Only

Place the switch in the console.



Using the remote engage switch

To engage a system using NavController III do one of the following:

- Firmware versions 5.20 and earlier: Hold down the remote engage switch for longer than 0.5 seconds and less than 4 seconds.
- Firmware 5.21 and later: Hold the switch down for longer than 0.15 seconds and less than 4 seconds.

The system engages when you release the switch.

8

Controller Installation

- Installing the NavController III—Case Luxxum
- Installing the NavController III—NH TD5 models
- Controller connections

Installing the NavController III—Case Luxxum

⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

Step 1

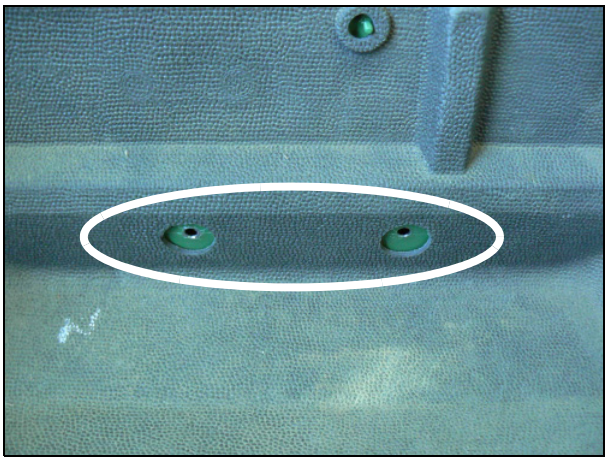
The NavController will be installed behind the seat of the machine.



Step 2

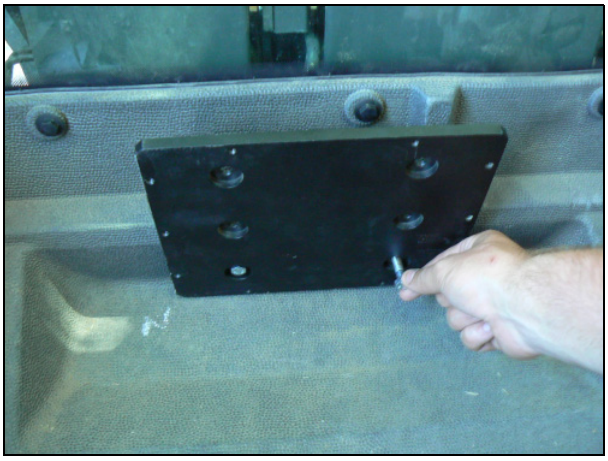
Using the controller mounting plate as a template, mark and drill two 5/16" holes for mounting the controller.

Carefully cut 1" holes around the drilled holes for mounting the standoffs.



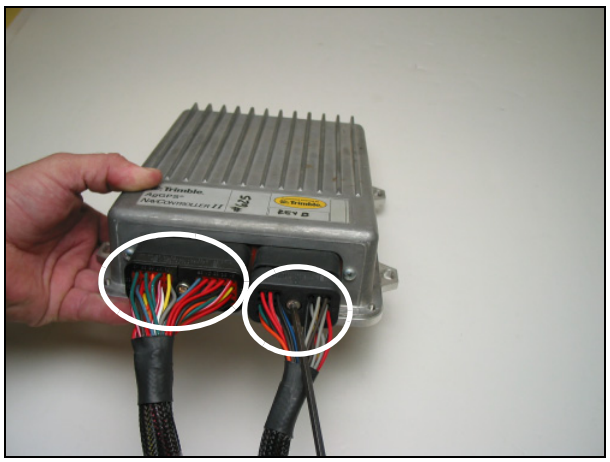
Step 3

Using the provided hardware and standoffs bolt the controller mounting plate to the machine



Step 4

Attach the main and auxiliary cable harnesses. Use an Allen wrench to secure the connectors to the controller.



Step 5

Attach the NavController to the controller mounting plate with the connector facing the right side of the vehicle.



Installing the NavController III—NH TD5 models

⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

Option A

The controller orientation for this location is:

- Roll = 285
- Pitch = 0
- Yaw = 90

Step 1

Locate the rear panel behind the seat. Remove the net.



Step 2

Remove the two screws that retain the window lock.



Step 3

Remove the fours screws that retain the rear panel.



Step 4

Push the plastic “L” shape toward the back and then remove the two plastic rivets.



Step 5

Remove the rear panel.



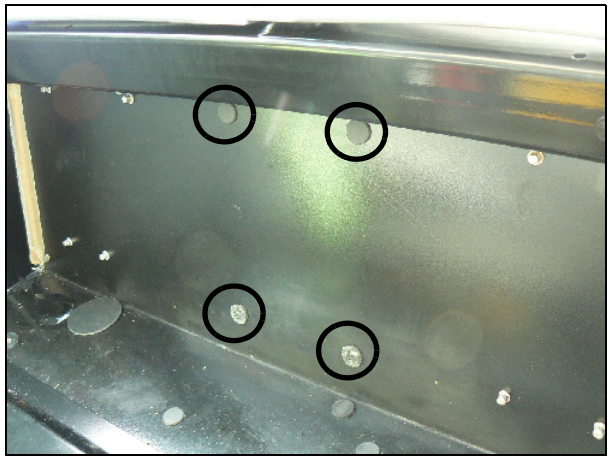
Step 6

Cut through the glue spots that hold the foam on and then remove the foam.



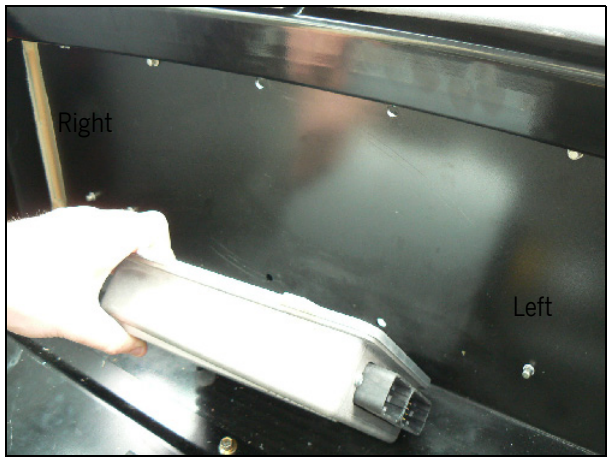
Step 7

Remove the four plugs from the controller mounting holes.



Step 8

From the inside of the cab, mount the controller with the connectors facing to the left of the vehicle.



Use the four provided #10 x ⅝" screws, four washers, and four nuts.



Step 9

Attach the main and auxiliary harnesses to the controller and then use an Allen key to secure them.



Step 10

Route the wiring harnesses toward the right rear corner of the cab.



Option B

If you use this mounting method, you must modify the controller orientation:

1. In the Autopilot controller orientation, open the direct entry screen.
2. Adjust the orientation as follows:
   - **Roll: 90**
   - **Pitch: 0**
   - **Yaw: 270**

Install the controller as follows:

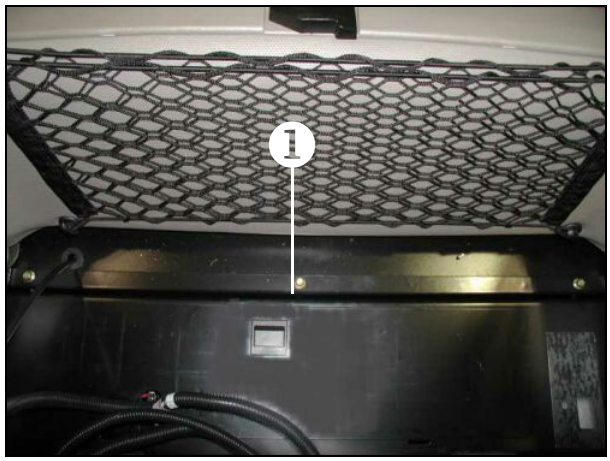
Step 1

Remove the rubber mat behind the operator's seat.



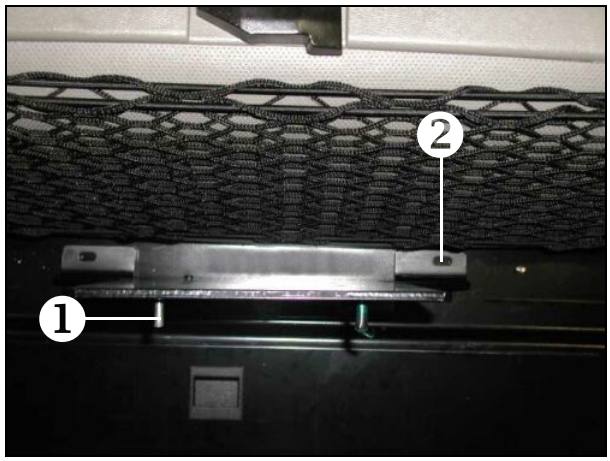
Step 2

Remove the center bolt ❶ in the access panel trim plate.



Step 3

Place the controller mounting bracket on the cab floor behind the operator's seat with the studs ❶ facing forward and slotted tabs ❷ on the floor. Install the M8 bolt and washer provided in the notch at the middle of the bracket and into the access panel.



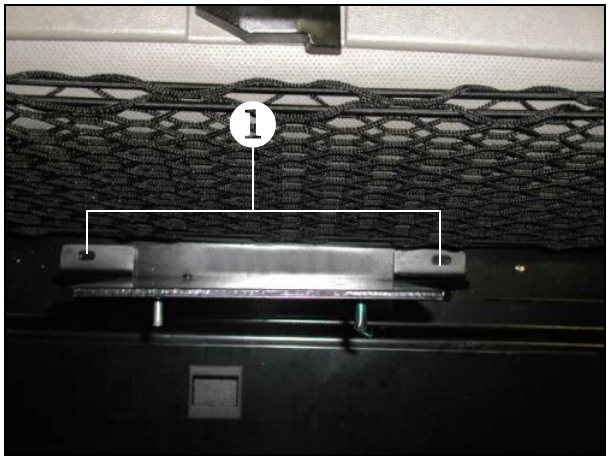
Step 4

Use the bracket as a template and mark the two holes in the center of each slot ❶. Remove the plate and drill two $^{5}/_{16}$" holes through the cab floor at each marked location.

NOTE – Make sure there are no obstructions under the cab before drilling.

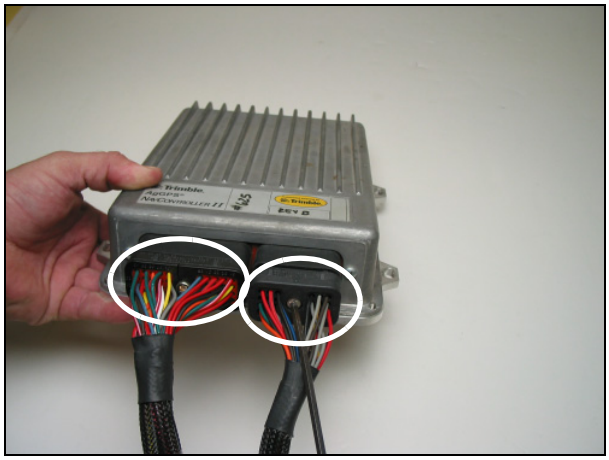
Install two ¼" -20 bolts, washers and lock nuts through the mounting bracket in the drilled holes. Replace the M8 bolt and washer in the notch of the mounting bracket and access panel. Tighten bolts.

NOTE – It may be easier to hold bolts in the cab through the rear window while tightening the nuts from outside the cab.



Step 5

Attach the main and auxiliary cable harnesses. Use an Allen wrench to secure the connectors to the controller.

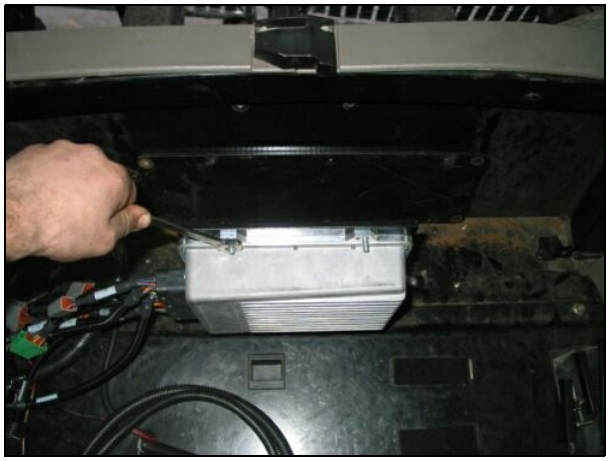


Step 6

Attach the controller with the flanges at the rear, and the connectors at right.

Use the existing four ¼" -20 studs, washers, and nuts to secure the controller to the mounting plate.

Route the cables coiling excess cable behind the rear cab panel.



Step 7

Notch the rubber mat to fit around the controller mounting bracket and install the mat.

Option C

The controller orientation for this location is:

- Roll: 281
- Pitch: 0
- Yaw: 90

Step 1

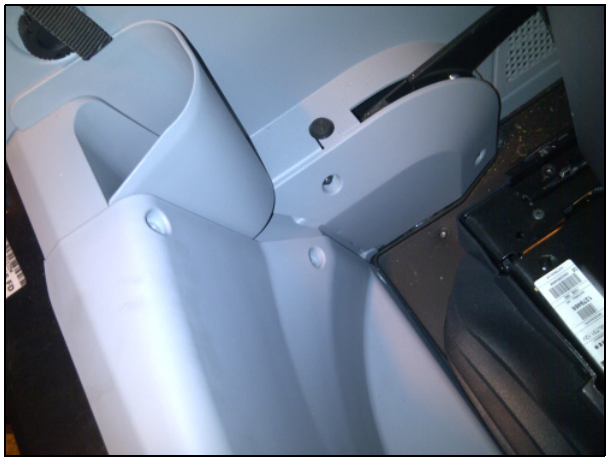
Locate the NavController II mounting position. The controller will be installed behind the panel shown behind the seat on the machine.



Step 2

Remove the fasteners holding the panel onto the machine and then remove the plastic panel.





Step 3

Install the NavController III on the back panel in the location shown here.

Use the NavController's mounting plate as a template to mark and then drill four 5/16" mounting holes.

Make sure the controller mounting plate is aligned squarely on the surface of the back of the cab. Check the placement to make sure the plastic cover with fit back over the NavController. You will use these to mount the mounting plate to the machine.

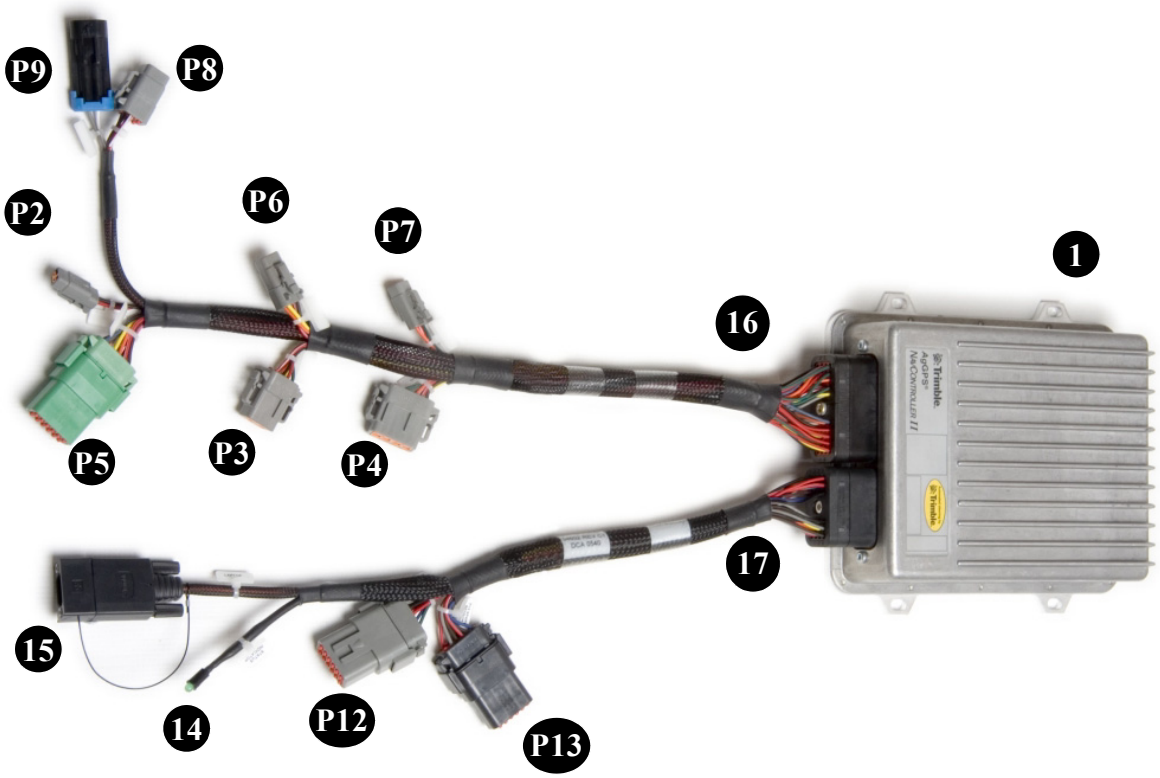


Step 4

Mount the controller mounting plate to the machine using the provided hardware and then mount the controller to the mounting plate using the provided 10-32 screws.



Controller connections

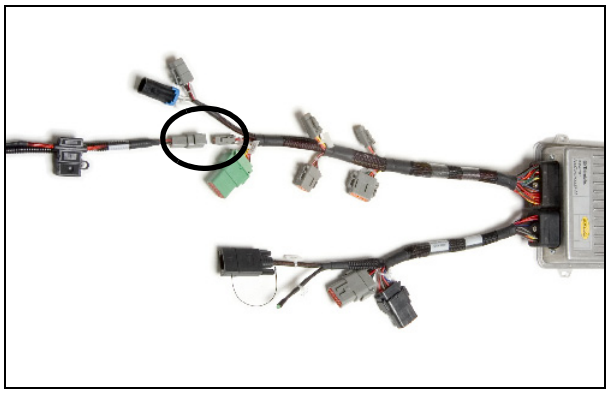


Item	Description	Item	Description
1	NavController III controller	P9	Sonalert connector
P2	Power connector	P12	Lightbar/spare connector
P3	GPS connector	P13	Spare sensors connector
P4	Display connector	14	Status indicator
P5	Vehicle sensors connector	15	Laptop connector
P6	Steering sensor connector	16	Main harness
P7	Manual override connector	17	Auxiliary harness
P8	Hydraulic valve connector		

Step 1

Connect the power cable connection to P2, which is labeled **Power**. P-2 is located on the main wiring harness.

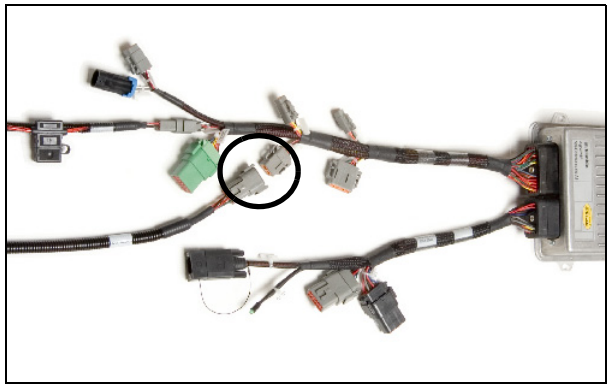
NOTE – The power connection supplies power through the controller to all connected devices, including GNSS and displays.



Step 2

Connect the GPS cable connection to P3, which is labeled **GPS**. P-3 is located on the main wiring harness.

NOTE – If you are using a TMX-2050 or CFX-750 display, attach the main display cable here, P/N 75741.



Step 3

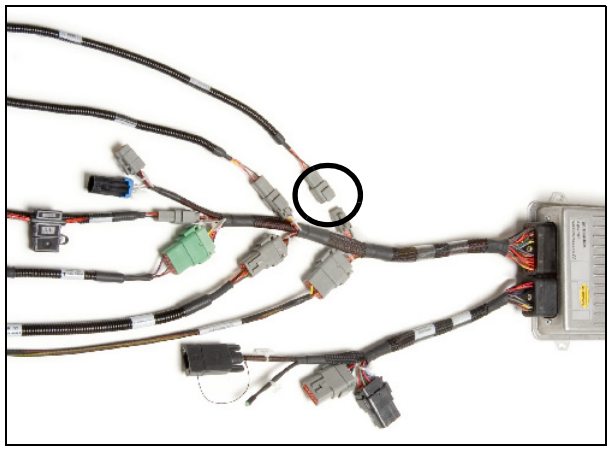
With the cable routed to the NavController, the R1 connector will connect to the P12 connector on the 54602 harness on the NavController as shown.



Step 4

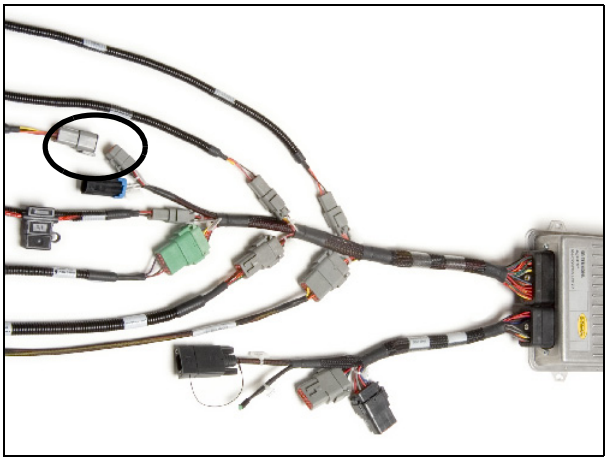
Connect the manual override cable connection to P7, which is labeled **Manual Override**. P7 is located on the main wiring harness.

NOTE – When you install the remote engage harness, add the pins to the existing connector.



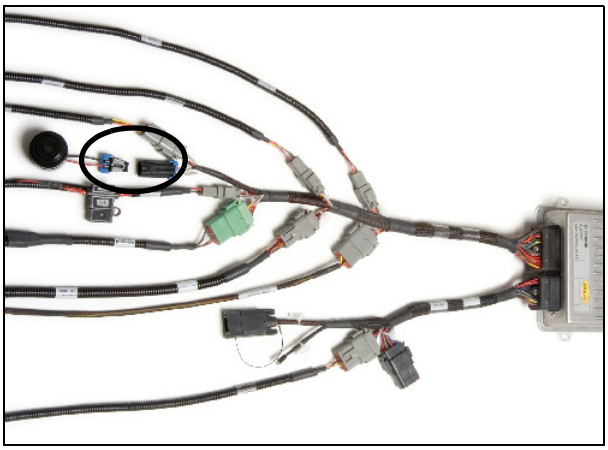
Step 5

Connect the hydraulic steering valve cable connection to P8, which is labeled **Hydraulic Valve**. P8 is located on the main wiring harness.



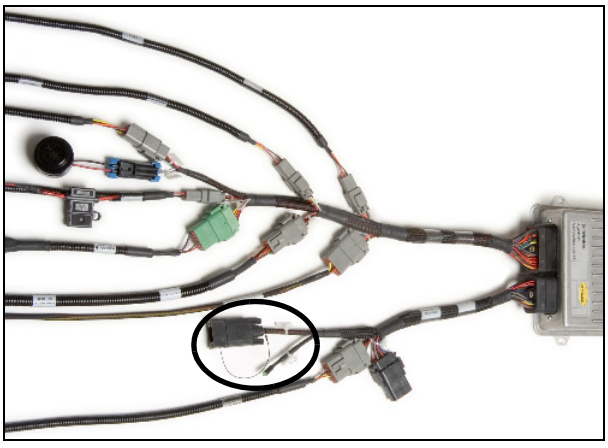
Step 6

Connect the Sonalert P9 to the two pin Delphi connector on the main wiring harness. Route the cable so the Sonalert warning device is in a position that is audible to the operator.



Step 7

Route the LED and laptop lead, which is located on the auxiliary wiring harness, to a location that allows the operator to determine the controller status. See controller LED status for status determination. Six flashes per second indicates a correctly functioning controller.



Step 8

Use the provided sleeving to secure the harness cables with tie wraps. Cover and route the cable bundle to avoid damage to connectors and strain on wire connections.

9

Isolation Models Setup Instructions

- Connecting the isolation solenoid cable
- Configuring the NavController III to turn on the electronic isolation manifold
- Advanced setup instructions

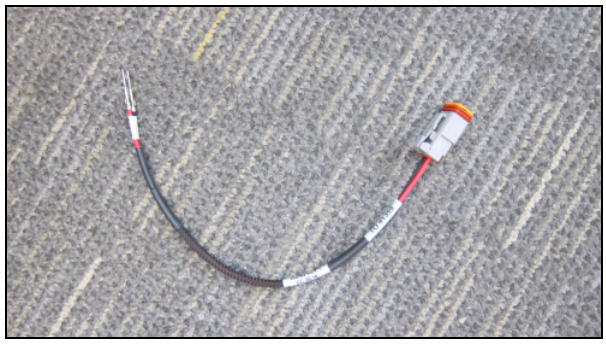
These instructions must only be completed by users familiar with operation of H4 manifold.

Connecting the isolation solenoid cable

Connect the P/N 100199 and 103378 cables to provide power to the Autopilot cut-off coil.

Locate the supplied P/N 103378 and 100799 isolation manifold cable in the isolation manifold kit.





Isolation manifold power connection (available only with NavController III)

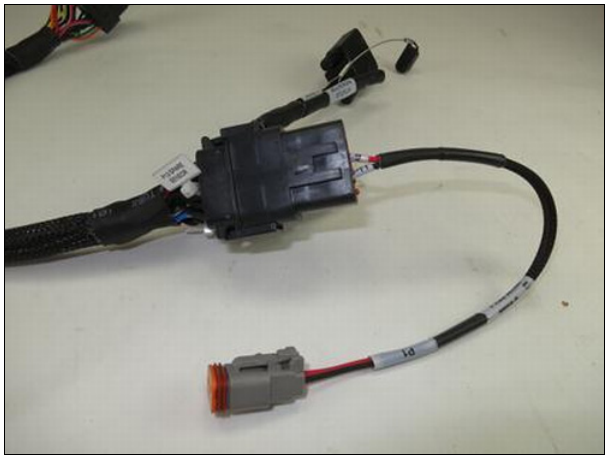
NOTE – This feature *is not* available with the NavController II.

NOTE – This connection type activates the isolation manifold automatically, using the third solenoid drive function of the NavController III.

Follow this procedure to connect the P/N 100199 cable to the NavController III harness, P/N 54602.

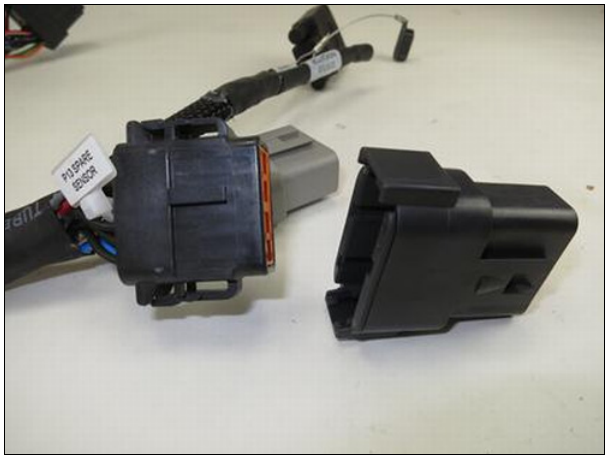
Step 1

Locate the supplied P/N 100199 cable in the isolation manifold kit.



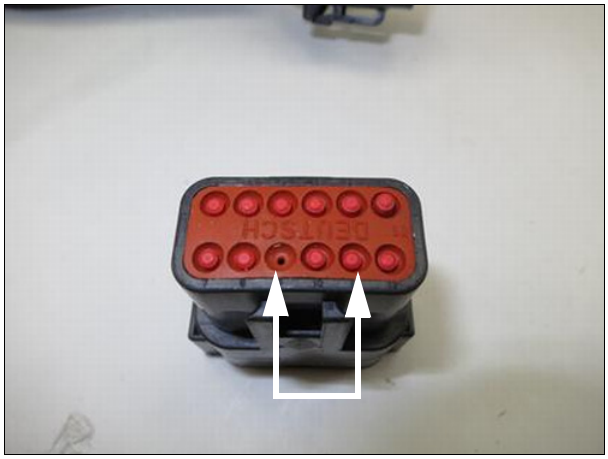
Step 2

Locate and remove the connector plug from the P/N 54602 P13 connector.



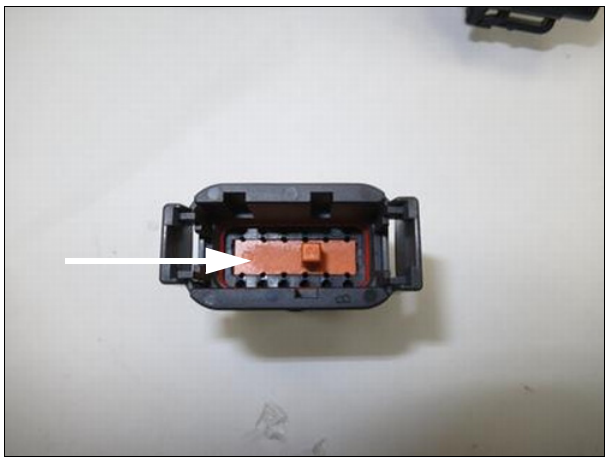
Step 3

On the rear of the plug, remove the sealing pins from the 9 and 11 sockets.



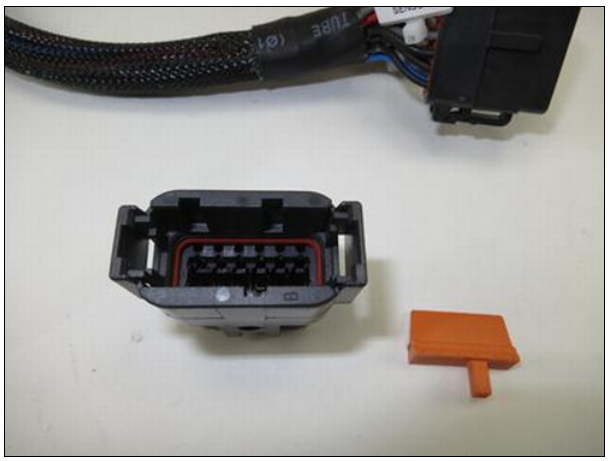
Step 4

On the inside of the connector, locate the orange wedge lock.



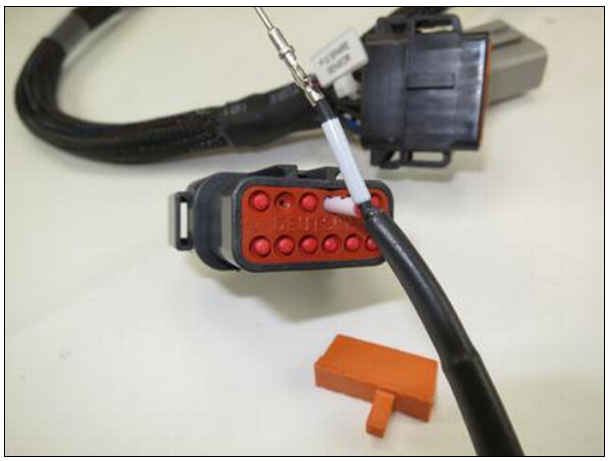
Step 5

Use needle-nose pliers to remove the wedge lock by pulling it straight out of the plug connector.



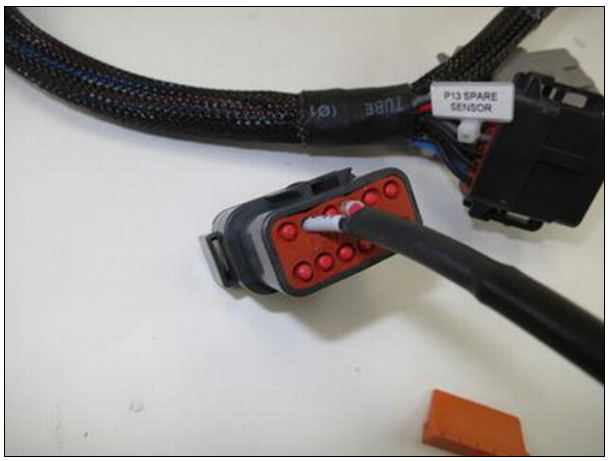
Step 6

Insert the pin labeled **to p13-9** into the 9-pin location on the connector plug.



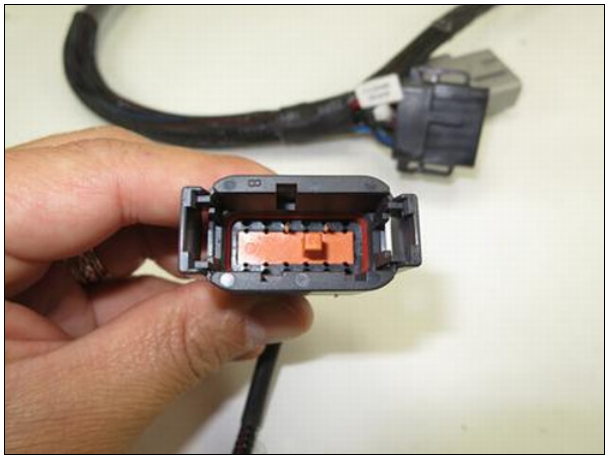
Step 7

Insert the pin labeled **to p13-11** into the 11-pin location on the connector plug.



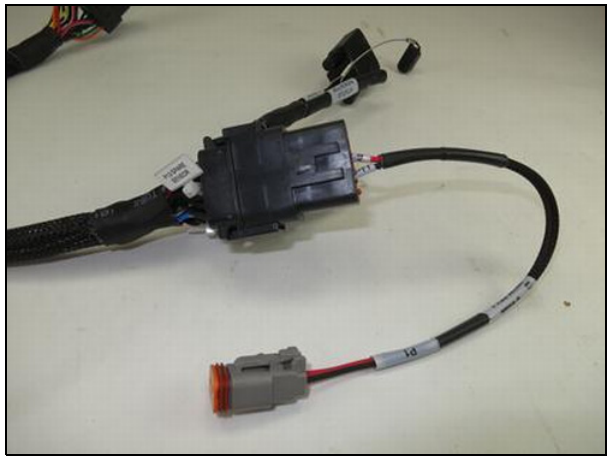
Step 8

Re-install the orange wedge lock into the connector plug.



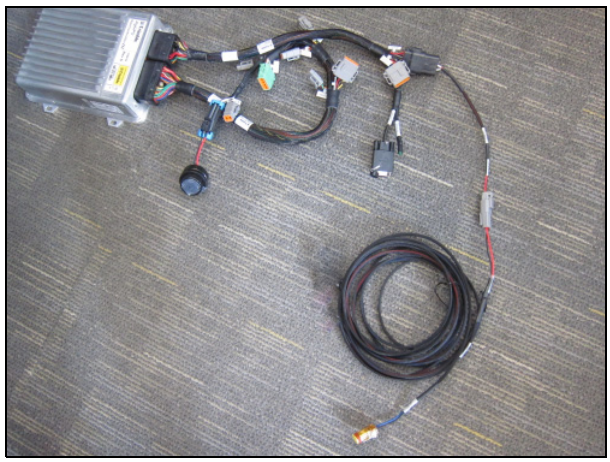
Step 9

Connect the P13 plug to the P/N 54602 harness on the NavController III.



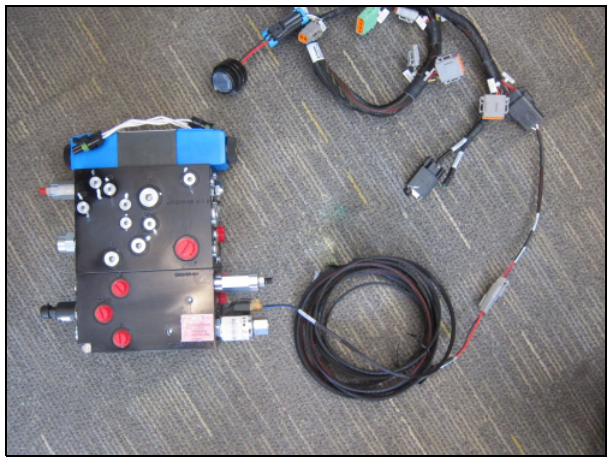
Step 10

Connect the R1 connector on cable P/N 103378 to the P1 connector on cable P/N 100799.



Step 11 - Connecting to the solenoid

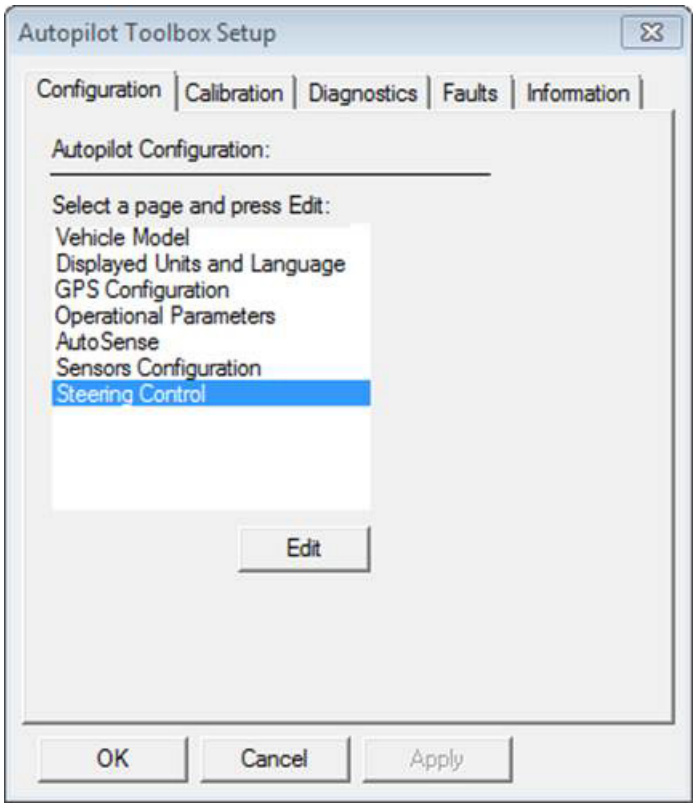
Route the P2 plug of cable P/N 103378 to the Autopilot manifold isolation solenoid and connect it as shown.



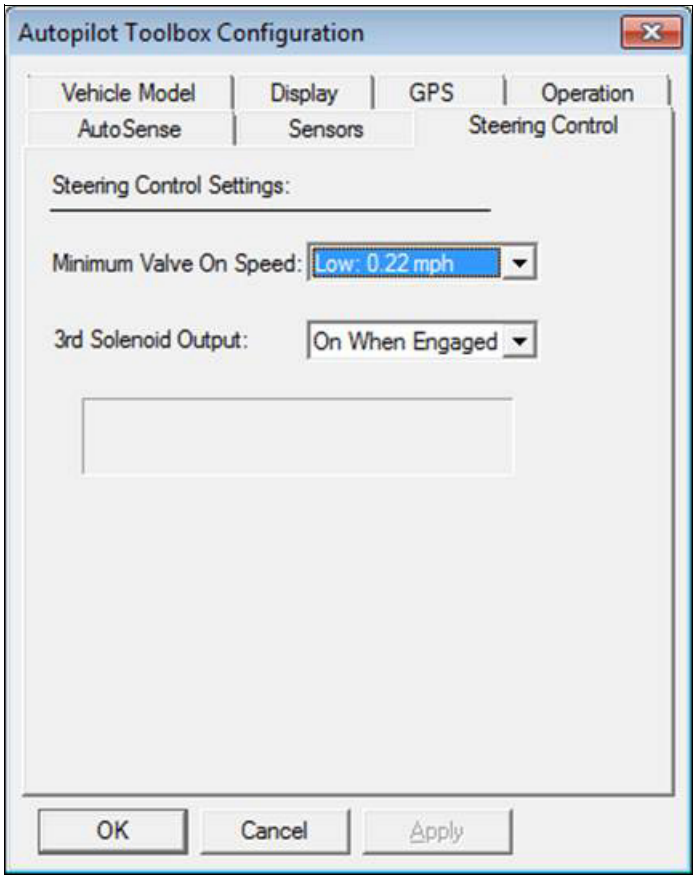


Configuring the NavController III to turn on the electronic isolation manifold

1. In Autopilot Toolbox version 3.3 or later, in the Setup screen, click the **Configuration** tab, select **Steering Control** and then click **Edit**:



2. From the **3rd Solenoid Output** drop-down list, select **On When Engaged** and then click **OK**:



NOTE – The **Minimum Valve On Speed** applies also to the third solenoid valve. The third solenoid will not be active until the set speed is reached. If the vehicle drops below the selected speed, the third solenoid will no longer be active.

In v5.61 of FMX+ or PIQ firmware, UI is available to enable the **3rd Solenoid Output** field. Note that this functionality is not available when using NextSwath Connect.

Advanced setup instructions

Setting the load sense relief pressure

The Load sense relief pressure should be set approximately 100 psi lower than the system relief pressure to allow margin in the adjustment and to fully protect the system. The default setting of the LS relief valve is 2700 psi. If a lower pressure is required, these instructions will provide a procedure for adjusting the LS relief pressure. The relief pressure should not be increased above 2700 psi.

Preparing to set the relief pressure

Step 1

Install a pressure gauge into the LS2 port; if no DSV2 cartridge is present, the PX ports can also be used.

Step 2

Connect the P line of the manifold to a 3000 psi pressure source such as a remote on a tractor.

Step 3

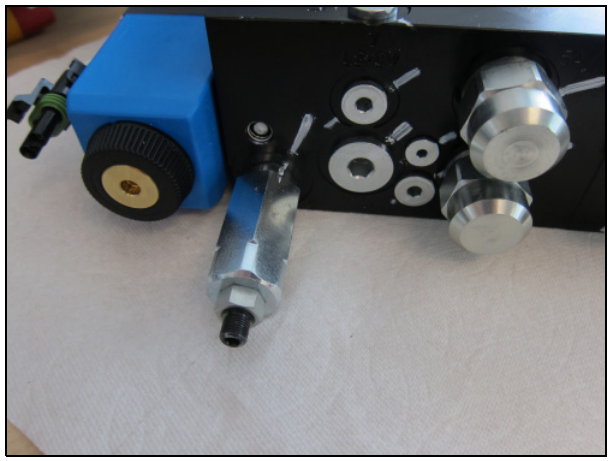
Connect the T line of the manifold to an oil tank or return line on the remote of a tractor.

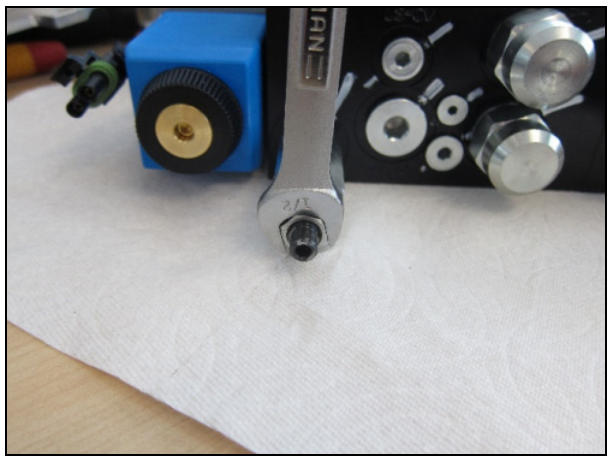
Step 4

The A and B / SCU-A, SCU-B lines: May be either connected to the steering cylinders / orbitrol or capped off for this test.

Step 5

Loosen the jam nut on the LS relief valve'

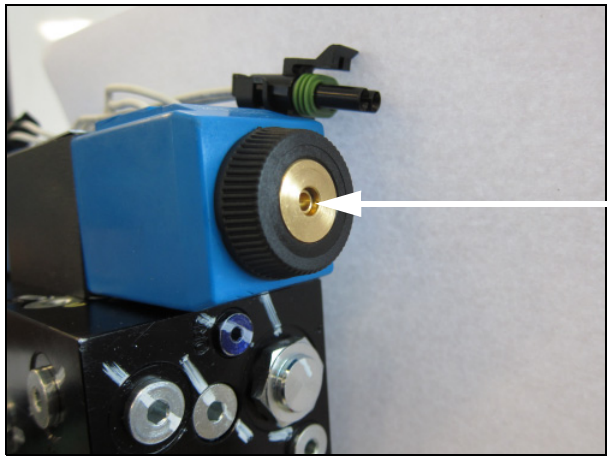




Step 6

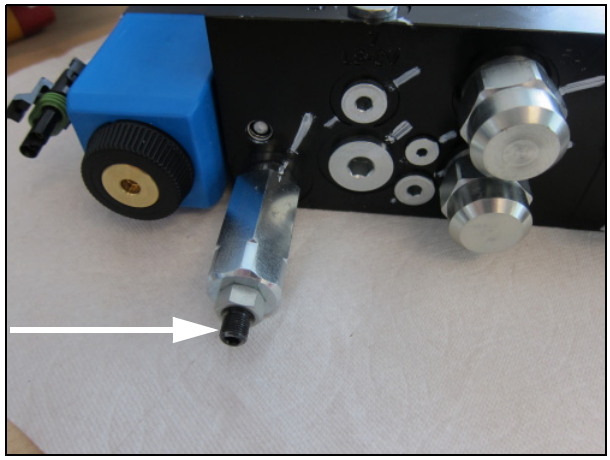
With pressure applied to the P port, press on one of the Detent overrides on the electro hydraulic valve. If the steering cylinders are present in the system, make sure to run the override until you hit and end stop to ensure you are at peak pressure.

NOTE – For systems with the isolation block, the isolation solenoid must be enabled.



Step 7

With the override pressed, turn the relief valve in or out and watch the gauge to set the LS relief pressure.



Adjusting the isolation manifold pressure reducing valve (PRV)

⚠ **CAUTION –** Increasing the pressure setting of the PRV can lead to the loss of ability to mechanically override the autopilot steering.

The isolation sandwich on the H4 manifold uses spring-biased pilot to shift cartridges to toggle between manual steering and Autopilot steering. The manual steering pressure adds to the spring cavity to pilot the cartridges open even in situations where the isolation solenoid were to remain on.

A Pressure reducing valve is present in the system to ensure that the isolation valve pilot pressure can always be overcome by the spring force + the manual steering pressure.

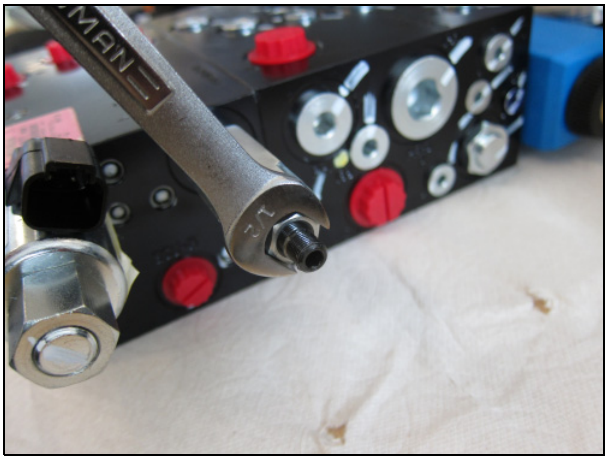
In some machines, it may be necessary to adjust the PRV setting in order to bias the cartridges more towards the manual steering or towards the Autopilot steering.

For the system to function as intended, manual steering should always overcome Autopilot steering. To test this function the P/N 103378 cable can be connected to the power bus or other 12 V source, with the switch on and 12 V being supplied to the cut-off coil. Manually steering the machine should result in movement of the wheels.

In the state where the isolation valve is powered when you are not steering manually, the Autopilot should be able to steer the machine; this means that if you were to press on the detent valve overrides you should be able to actuate wheel movement.

Step 1

Locate and loosen the jam nut on the PRV cartridge.



Step 2

Adjust the PRV valve by turning the screw with a hex wrench.

NOTE – Screwing the screw clockwise / inward will *add* pressure to the PRV setting, resulting in an increased bias towards Autopilot steering. This should be done if the Autopilot is sometimes not steering the machine.

Screwing the screw counterclockwise / outward will *reduce* pressure from the PRV, biasing the system more towards the manual steering side. The PRV setting should be decreased if the isolation solenoid is powered and manual steering is sometimes not possible.

10

Final Machine Check

⚠ **WARNING –** To avoid potentially serious personal injury or illness, and to prevent damage to equipment, make sure that you read and understand the Safety Information chapter.

1. Connect the battery.
2. Start the machine and check for hydraulic leaks. Correct as needed.
3. Update the Trimble display and the Autopilot NavController III to the latest firmware from agpartners.trimble.com.

   You can use FlashLoader 200 software version 3.19 to update the Autopilot controller: Download it from agpartners.trimble.com.
4. Load the correct configuration file into the Autopilot NavController III for the vehicle model being used.

   Download the latest set of configuration files from agpartners.trimble.com.

   You can use Autopilot Toolbox II software version 4.02 to load the configuration file into the Autopilot controller. You can download the Autopilot Toolbox II software from agpartners.trimble.com.
5. Calibrate the Autopilot system using the Trimble display or the Autopilot Toolbox II software. Depending on your machine type, the following items must be calibrated before you can use the Autopilot system:
   - NavController III mounting orientation
   - Manual override
   - AutoSense mounting orientation
   - Valve deadzone
   - Autopilot P-gain
   - Antenna height/Antenna axle offset, and Roll offset

Trimble Agriculture